January, 1957

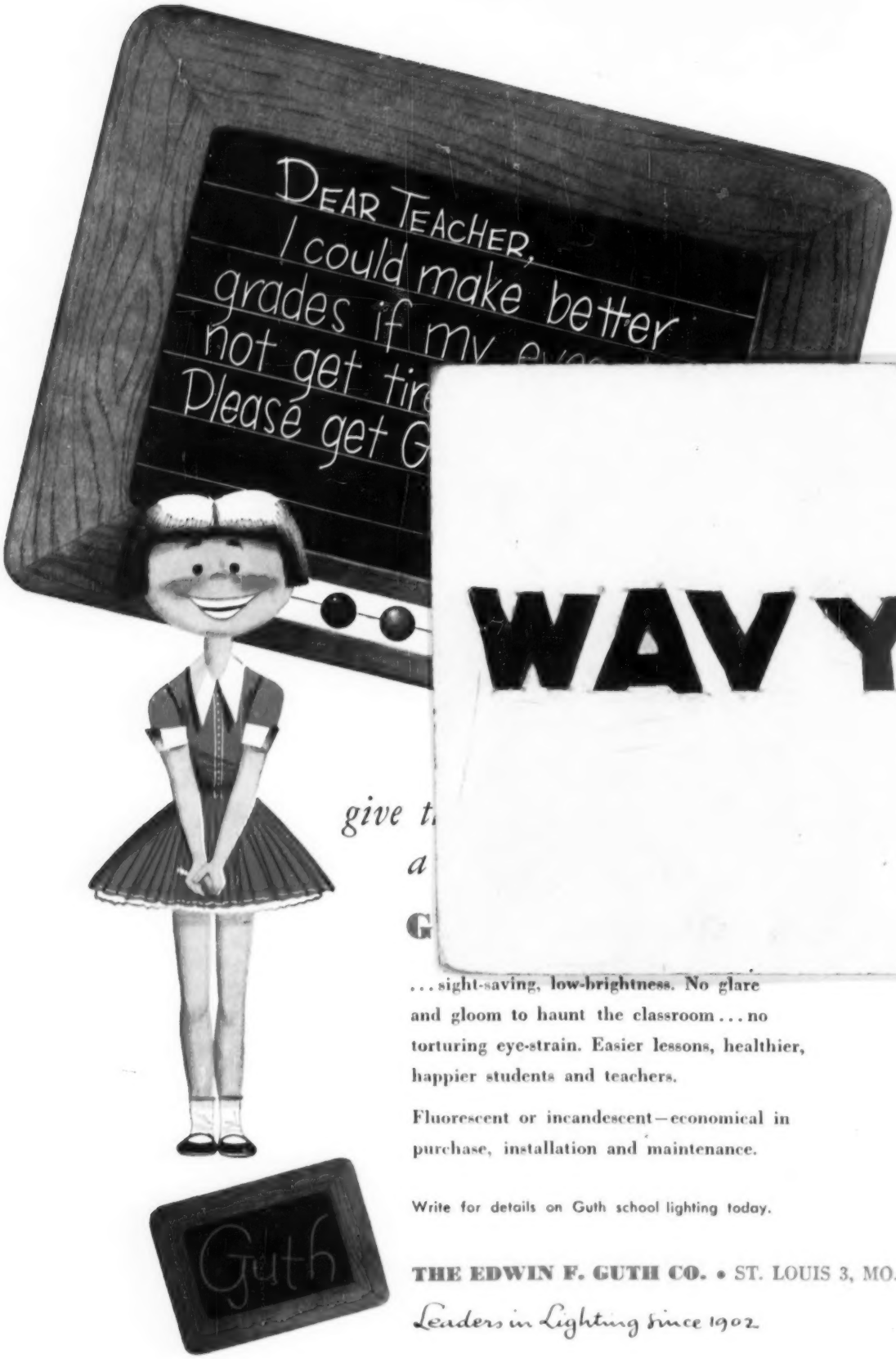
The American School Board Journal

A PERIODICAL OF SCHOOL ADMINISTRATION

Annual School Building Number

Site * Design * Planning * Finance
Lighting * Heating

Nordrum * Essex * Gilson * Knezevich * Cornell
Bush * George * Cross



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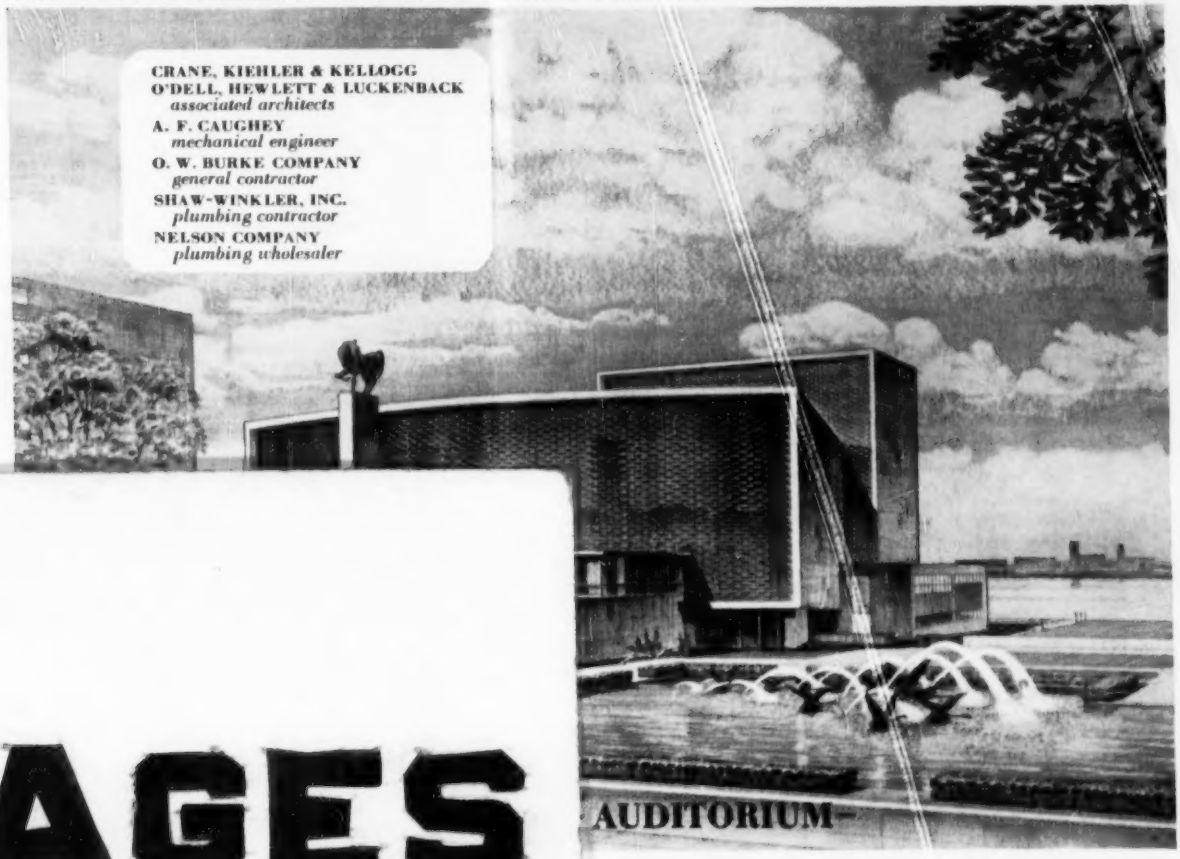

PAGES

DETROIT'S CIVIC PLAZA

from operas and symphony concerts to recitals and lectures; from dramas and motion picture spectaculars to radio and television broadcasts. Richly upholstered seating is provided for nearly 3000 persons on the main floor and in the balcony. Detroit cars may go directly down to a two-level underground garage or to a large open parking area. Cars from the Canadian shore, through a highway tunnel, may proceed directly into the garage or up to the surface parking area. As are thousands of other fine buildings, this ultramodern auditorium is equipped with SLOAN *Flush* VALVES.

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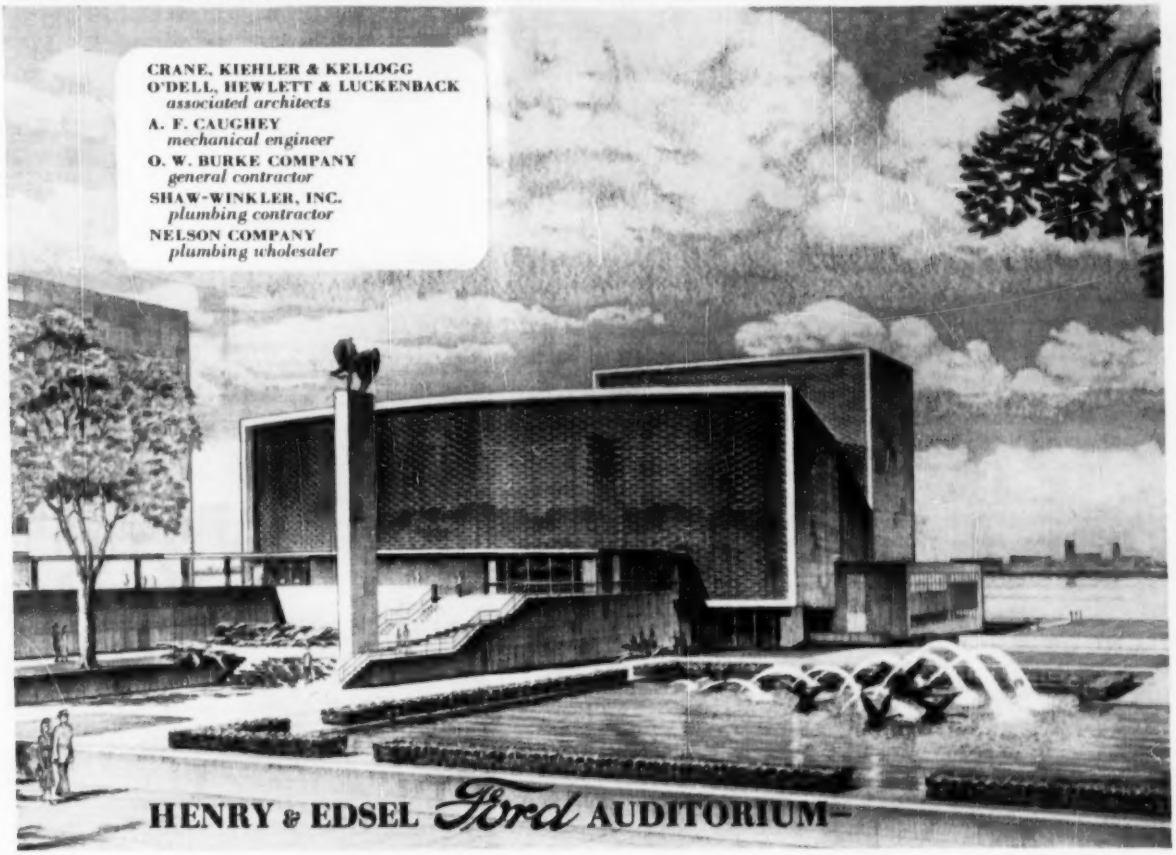

SPARKLING GEM ON DETROIT'S CIVIC PLAZA

• Centered in Detroit's multi-million dollar Civic Plaza is the recently dedicated auditorium which is destined to become the focal point of the city's cultural interests and activities. Its gem-like exterior is of Georgia white marble with Swedish blue pearl granite, faceted to enhance its brilliance. The completely air-conditioned interior is equipped with facilities for diversified performances, from operas and symphony concerts to recitals and lectures; from dramas and motion picture spectaculars to radio and television broadcasts. Richly upholstered seating is provided for nearly 3000 persons on the main floor and in the balcony. Detroit cars may go directly down to a two-level underground garage or to a large open parking area. Cars from the Canadian shore, through a highway tunnel, may proceed directly into the garage or up to the surface parking area. As are thousands of other fine buildings, this ultramodern auditorium is equipped with SLOAN *Flush* VALVES.

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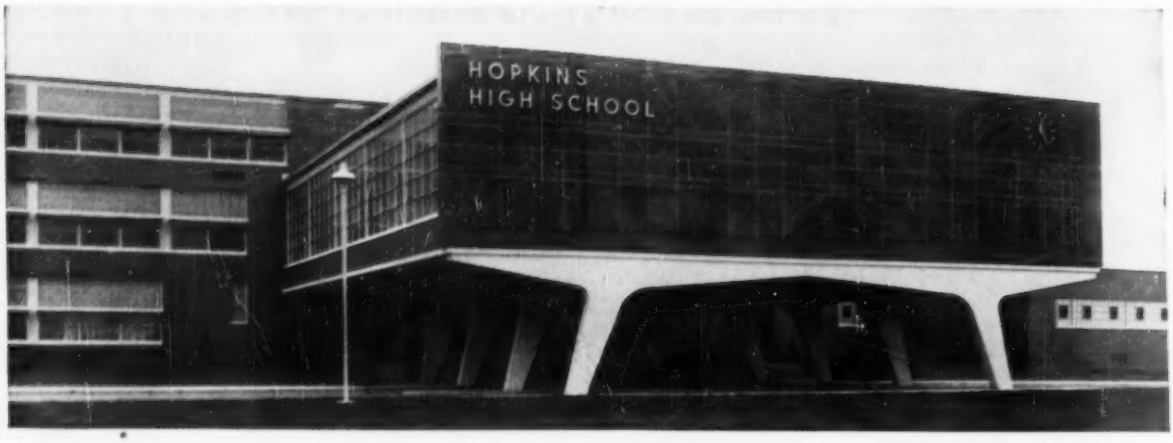

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The modern functional design of this impressive suburban school reflects two of the most important factors to consider in planning today's schools—widely diversified usage requirements and extensive use of facilities for "after-hours" activities.

The flexibility of Johnson *Dual* Temperature Control easily satisfies the varied needs of such schools. At the 2,000-capacity Hopkins High School*, the requirements involve not only the control of heating and ventilating equipment, but also the year 'round regulation of a multi-zone air conditioning system in a business administration wing.

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At the end of the school day, all *Dual* Thermostats in the building are reset, from a central point, to operate at reduced non-occupancy temperatures. If a room continues in use, merely pressing the button on the *Dual* Thermostat restores it to normal occupancy temperature, *without affecting the economy settings of other thermostats in the building.* Fuel savings are impressive.

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Johnson *Dual* Control makes any school easier to plan, less costly to operate. The unmatched comfort, economy and flexibility of Johnson *Dual* can be applied to all types of heating, ventilating and air conditioning systems. A nearby Johnson engineer will gladly supply complete information without obligation. Johnson Service Company, Milwaukee 1, Wisconsin. Direct Branch Offices in Principal Cities.

*Hopkins High School, Hopkins, Minnesota, Bissell & Belair, architects, Minneapolis; G. M. Orr Engineering Co., mechanical engineers, Minneapolis.

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THE AMERICAN
School Board Journal

for January, 1957

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The Northwest Classen high school in Oklahoma City, featured in the JOURNAL's review of school planning and construction for 1957, is an academic urban secondary plant designed for the typical square city site. A campus high school for a balanced curriculum in a smaller city is illustrated by the Sunnyside, Wash., high school; economical and compact, the Northwest Area's high school in Luzerne County, Pa., has a general-agricultural program for its rural students.

We're sure you'll also be interested in some of the "special" buildings presented.

Heading the list of general articles is Mr. Essex's capsule report on all of the contemporary "Trends in School Design."

Mr. Cornell considers high school size and building cost; Dr. Knezevich defines the properly-sized school enrollment; Dr. Darby explains the "why" and "how" of a school lighting survey.

There are still other articles that deserve your attention and don't miss the JOURNAL's regular features!

WILLIAM C. BRUCE, Editor

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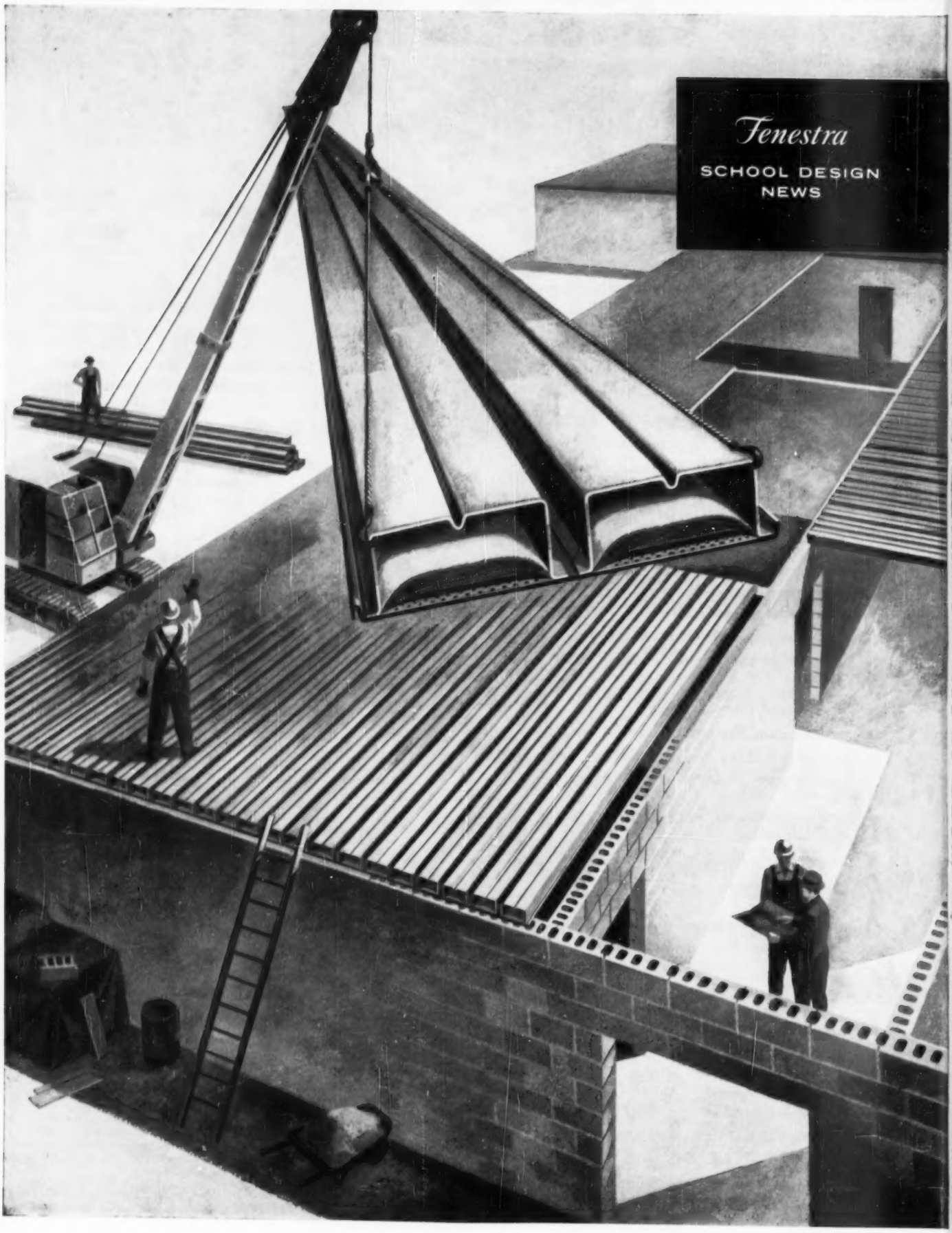
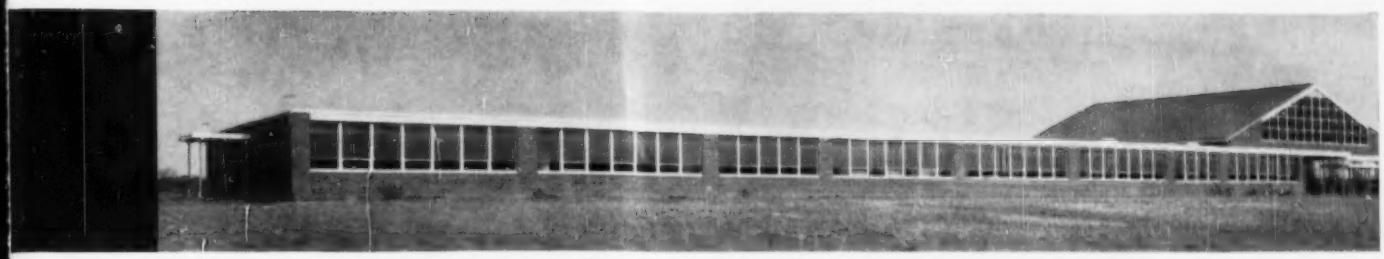
EDITORIAL MATERIAL. Manuscripts and photographs bearing on school administration, superintendence, school architecture, and related topics are solicited and will be paid for upon publication. Contributions should be mailed to Milwaukee direct and should be accompanied by return postage if unsuitable.

The contents of this issue are listed in the "Education Index."


Fenestra
SCHOOL DESIGN
NEWS



Fowlerville High School, Fowlerville, Michigan, is designed with interior load-bearing masonry walls and Fenestra Acoustical-Structural "D" Panels to reduce structural steel requirements to a minimum. Total costs for this 41,000 square foot school were approximately $11.00 per square foot . . . an economical figure for high school construction in this area.

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Contractor: Vandenburg Construction Co., East Lansing, Michigan.

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Spanning between interior masonry bearing walls, Fenestra Panels practically eliminate structural steel and reduce foundation and footing requirements. Schools using this basic structural system have been built in many different areas at costs from $9.00 to $12.00 per square foot depending on mechanical facilities, interior trim and accessories.

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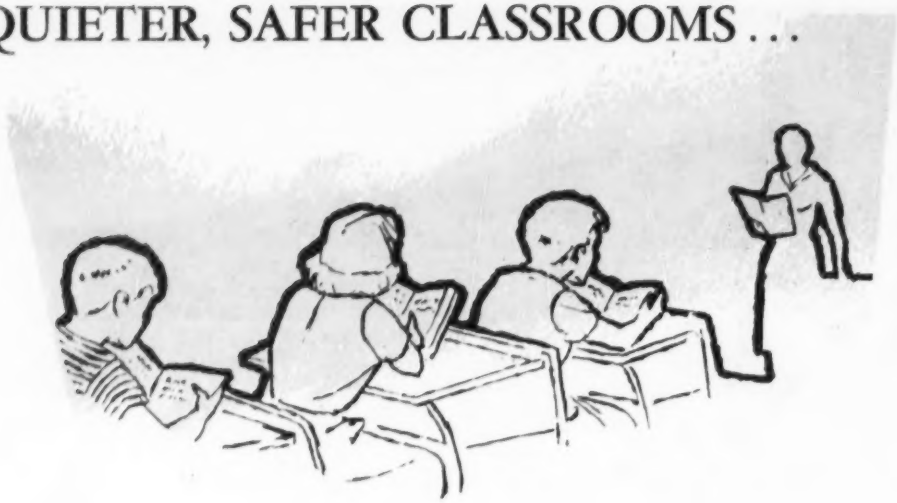

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How much is it worth for students to hear their teacher in the classroom? Just about as much as their future happiness is worth! In many instances children caught in crowded classrooms on short schedules are in serious danger of being deprived of the education they need to fit them for the problems ahead — simply because they cannot hear their teacher over the reverberation of sounds within the classroom and noises originating outside. Good soundproofing and good acoustics provided by Genuine lath and plaster walls and acoustical plaster ceilings give children their one chance to learn . . . with the one material that provides an American Standard fire-resistance rating of from a minimum of one full hour to as high as four hours, depending on type of construction.

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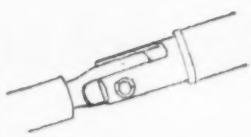
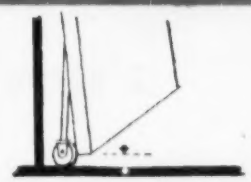
Schieber uses 800 lbs. pull test anchors, not screws, for securing tops to understructure.



Forged clevis hinges with snag-proof snap rings provide rigid, rattle-free assembly.

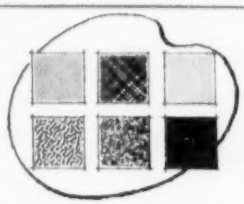
All joints are welded and welded in precision jigs.



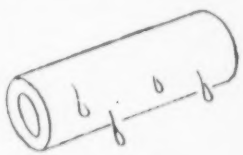
Tables and benches roll all the way into pockets on casters—do not drag last few inches.

Mark-proof rubber casters protect floors.

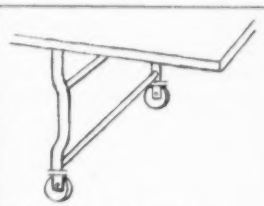
In-Wall units are counterbalanced for ease of operation.



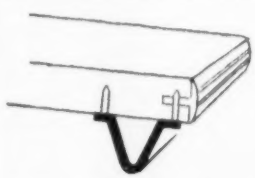
Surfaces in optional colors and patterns.



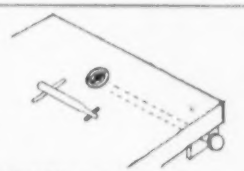
All casters equipped with permanent oil impregnated bearings—no oiling, ever.



Understructure is heavy 1-inch steel tubing with .840" wall.



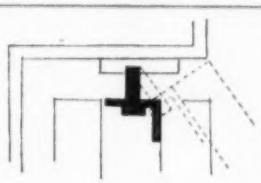
All edges finished with permanently bright "T" stainless steel moulding.



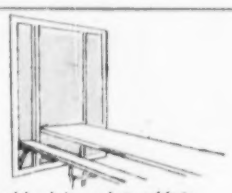
Defachable units secured in tracks with retractable roller buttons. Can't come out unless intentionally detached.

Center casters are swivel type for easy maneuvering of detached tables and benches.

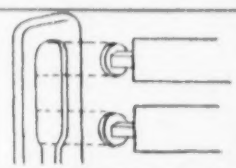
Benches reinforced by four (not two) longitudinal, formed steel stringers.



Safety catch prevents folded units falling from pocket when being operated.



Steel back in pockets adds to rigidity, eliminates contractor finishing.



Any height unit may be returned to any pocket. Welded-on (not cut outs) tracks have long keyhole slots.

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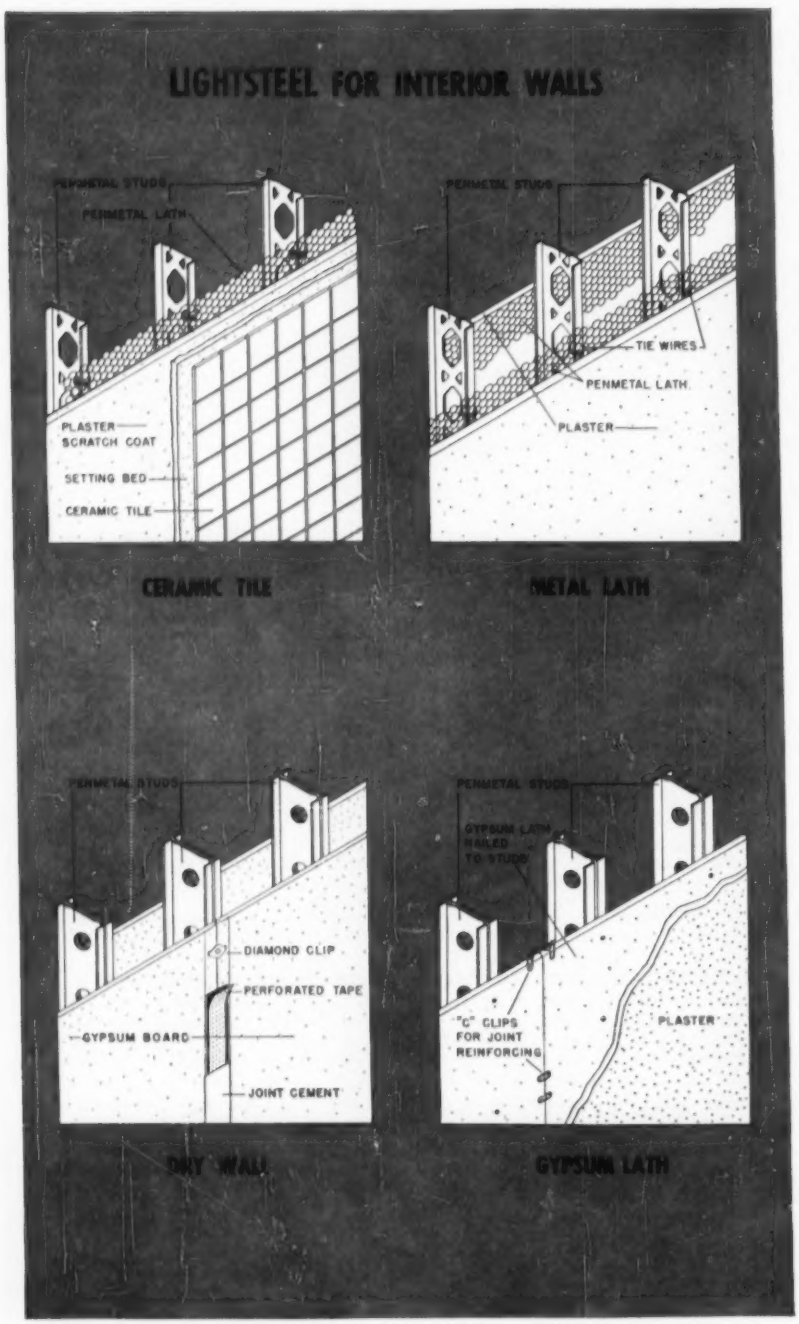

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Surveying the School Scene

SCHOOL DISTRICTS

A study of the U. S. Bureau of the Census indicates that the total number of school districts in the United States is 51,881 as of September, 1956. There are also in operation 2521 other public school systems under the control mostly of county, municipal, and township governments. The latter number includes the state-administered school systems of Delaware and Maine, and 465 local school systems in Pennsylvania, operated jointly by two or more school districts.

In 1942 there were in operation 108,579 school districts, and by 1951–52 the total had dropped to 67,346. The reductions were made principally in Illinois, Michigan, Minnesota, Nevada, Nebraska, New York, and Wisconsin. The largest reduction was made in Minnesota where 42.5 per cent of the school districts were eliminated by consolidations or annexations. In Illinois the reduction was 41.9 per cent, and in New York, 40.7.

The trend toward lessening the number of districts was reversed in the states of Missisippi, Montana, Nevada, New Hampshire, New Mexico, and Vermont, all of which report small increases in the number of operating districts.

Nebraska has 4991 school districts, the largest number of all the states. Wisconsin is listed second with 3832 districts, and Iowa is third with 3696 districts. The movement for improving schools through the betterment and enlargement of attendance and administrative districts is moving forward at widely varying rates of progress and effectiveness.

FIVE CURRENT ADMINISTRATIVE QUESTIONS

At the annual convention of the New York State School Boards Association, October 22, State Supt. James E. Allen, Jr., of the New York State Department of Education, presented five questions to the assembled school boards, which in his opinion deserve consideration on the part of school boards if they and the officials of the local schools would continue to deserve public support. While the questions were raised to meet the New York situation, they apply quite definitely to every state in the union. In concluding his lengthy address, Dr. Allen said:

The public values education and is willing to support it, but more and more of our citizens want to be shown that their increased support has resulted in real improvement in education. It would seem, therefore, that a checklist of evaluative questions would be useful as a means of guiding our planning to produce school systems which give full measure of quality education for money invested. I would like to suggest five such questions for your consideration.

Question 1. Have you formulated a plan for the improvement of your schools? Every school board should have a long-range plan for the expansion of educational opportunity in that board's community and for the improvement of the quality of the educational program. This plan should be developed with the aid of your staff and should be available to and understood by them and by the citizens of your district.

Question 2. Do you have a specific program for the improvement of instruction in your school system? Such a program should reveal consideration of at least the following factors: (*a*) a salary schedule high enough to assure getting and keeping good teachers; (*b*) incentives which award teachers for outstanding achievement in teaching; (*c*) an in-service program which offers your teachers opportunity to grow in knowledge, creativeness, and imagination; (*d*) sufficient clerical assistance and other aides so that the talents and energies of your teachers will not be wasted in performing nonteaching duties; (*e*) adequate instructional materials to enable teachers to enrich their teaching and increase the effectiveness of learning; (*f*) a good guidance program.

Question 3. Have you provided adequately for the administration and supervision of your school system? Education today is big business. It is just about the most important business in your community. To administer it efficiently and economically requires top-level educational leadership and management procedures. The employment of a well-qualified person for your school administrator is your most important job. He should be well paid and provided with adequate staff specialists so that his time can be devoted to professional leadership and not wasted by unnecessary attention to detail and clerical duties.

Question 4. Have you a plan for evaluating the quality and achievement of your schools? As school board members, you have made serious efforts to raise budgets, to increase classroom space, and do many other things to make your school system better. What steps have you taken to find out whether such efforts are bearing fruit? Can you answer the taxpayer in your community who asks: "Just how good are your schools?" "Are they better than last year, or worse?" "What have you accomplished as a result of the additional state aid received and school taxes paid?" To do so requires that you have a plan for evaluation and for holding your staff members responsible for results.

Question 5. Do you have a systematic program for reporting on your stewardship of the people's schools to the citizens of your community? Keeping the public informed periodically and regularly about the progress and needs of their schools is essential for public understanding and support of good schools. Failure to do so leads to suspicion, distrust, and deterioration in the quality of the schools.

DR. DERTHICK APPOINTED

Dr. Lawrence G. Derthick, superintendent of schools at Chattanooga, Tenn., has been appointed by President Eisenhower as U. S. Commissioner of Education. He succeeds Dr. Samuel M. Brownell, and will fill the position which has been vacant since September 1, when Dr. Brownell resigned to become superintendent of schools at Detroit. He will receive a salary of $14,800 a year.

Dr. Lawrence G. Derthick

Dr. Derthick who has been prominent as a director and, in 1954, president of the AASA., is a native of Kentucky and served as superintendent at Nashville from 1939 to 1942; he has been superintendent at Chattanooga since 1942.

PROPOSES FEDERAL PROGRAM

In an address to the National Council of Social Studies, in Cleveland, Ohio, November 22–24, 1956, Walter Reuther, president of the auto workers union, proposed a program of federal aid to education, to cost $40 billion or more in a period of five years. This program would cost from 1¼ to 2 per cent of the gross national product. It would provide assistance for (1) building 300,000 additional classrooms, (2) substantial increases in teachers' salaries, (3) establishment of a federal scholarship program, (4) federal and state co-operation in the education of gifted children, and (5) setting up a method of preventing private industry from pirating teachers.

UPGRADE ADMINISTRATORS

A new organization, calling itself the National Council of Administrative Leadership, has been formed to upgrade school administrators. The Council, made up of representatives

of 31 universities, will have the task of raising the standards for selecting school administrators. The present method, it is pointed out, varies from rigorous certification to putting in whoever will run for office as long as he can read. The Kellogg Foundation will assist with a $400,000 grant to finance the organization and operation of the Council.

SCHOOL EXPENDITURES

Public school expenditures per pupil did not increase as rapidly as average personal income during the 15-year span ending in 1954, according to the latest biennial survey of the U. S. Office of Education.

The report shows that the average personal income, after taxes, increased 184 per cent from 1939–40 to 1953–54, while current school expenditures per pupil increased only 159 per cent during the same period.

The average annual salary paid to teachers in city school systems in 1953–54 was $4,190, a 9 per cent increase over 1951–52. Smaller cities had the largest gains.

School clerical help received an average annual salary of $1,699 in 1953–54, and there was less than one full-time clerical employee per school.

City school systems received 63.1 per cent of their funds from city school taxes. Financial backing came from the states, which provided 27.8 per cent; counties, 6.9 per cent; and other sources, 2.2 per cent.

LIMA ADVISORY COMMITTEE

The Citizens Advisory Committee of Lima, Ohio, has engaged in a comprehensive series of jobs intended to improve communication between the people of Lima and the schools and planned to improve the attitudes of the community and of the schools and ultimately to better the instructional services which the schools provide. In an address to the teachers of the city, Supt. Gordon G. Humbert, recently outlined the work of the committee and described in popular form the underlying philosophy of the committee.

SPEECH EDUCATION

A program of speech education is being carried out in the Wall township schools at Allenwood, N. J. The program emphasizes special education for children with disorders of speech stemming from organic causes, and also offers training for the mentally retarded. Children with impaired hearing receive supplementary instruction for the hard-of-hearing while attending regular classes. The instruction includes auditory training, speech reading, speech correction, and language development. A pure tone, audiometric screening survey is used to test the hearing acuity of children.

EDUCATIONAL RESEARCH

The U. S. Office of Education has approved contracts with seven colleges and universities for co-operative educational research. The contracts include three with Syracuse University, two with Boston University, and one each with Indiana University and Regis College. The agreements are another step in the co-operative research program begun recently under a $1 million appropriation made by Congress.

COLLEGE ENROLLMENT

The U. S. Office of Education has reported that 2,957,227 students are enrolled in credit courses in the nation's colleges and universities this year. This exceeds last year's figure by 236,298, a gain of 8.7 per cent. There were 735,065 new students enrolled in September, an increase of 6.6 per cent.

LIBRARY PROGRAM

In Clarkston, Mich., a unique school library program is in operation. A mother who believed the library to be inadequate formed a library club of seven, which eventually grew to 125 mothers, operating five elementary school libraries. Each school has its own library group, and each group is a member of the association. These mothers select the books, raise the money, work in shifts as librarians, mend books, and prepare the catalog. The school provides one elementary librarian, who serves as a resource person. The plan has provided excellent libraries and has proved an excellent public relations program.

COMING CONVENTIONS

Jan. 10–11. Tennessee School Boards Association, at Andrew Jackson Hotel, Nashville. Secretary, Dr. William B. Rich, Nashville. Attendance, 250.

Jan. 15–16. Kansas Association of School Boards, at Topeka, Kans. Secretary, Carl B. Althaus, Lawrence. Attendance, 250.

Jan. 15–17. Manitoba, Canada, School Trustees Association, at Winnipeg. Secretary, B. Harold Stinson, Winnipeg, Manitoba. Attendance, 800–1000. Exhibits.

Feb. 3–5. Louisiana School Boards Association, Baton Rouge. Secretary, Fred G. Thatcher, Baton Rouge. Attendance, 500.

Feb. 5–7. Minnesota School Boards Association, at St. Paul. Secretary, W. A. Wettergren, St. Peter. Attendance, 3000. Exhibits.

Feb. 14–16. National School Boards Association, at Chalfonte-Haddon Hotel, Atlantic City, N. J. Secretary, W. A. Shannon, 450 E. Ohio St., Chicago 11, Ill. Attendance, 2000.

Feb. 15–20. American Association of School Administrators, at Atlantic City, N. J. Secretary, Finis E. Engleman, 1201 — 16th St., N.W., Washington 6, D. C.

School system cuts towel costs 29% with Mosinee Turn-Towls

A school system in Michigan* with an enrollment of 1200 switched to Turn-Towls after using a towel of ordinary quality.

The cost of service per school year with the previous towel service was $616. Combining Turn-Towl drying qualities and the controlled dispensing feature of the Turn-Towl cabinet reduced the annual cost of the service to $436.

Improve your washroom facilities — and save money, too — with Mosinee Turn-Towl service. Write today for the name of your nearest Mosinee Towel Distributor.

*Name on request

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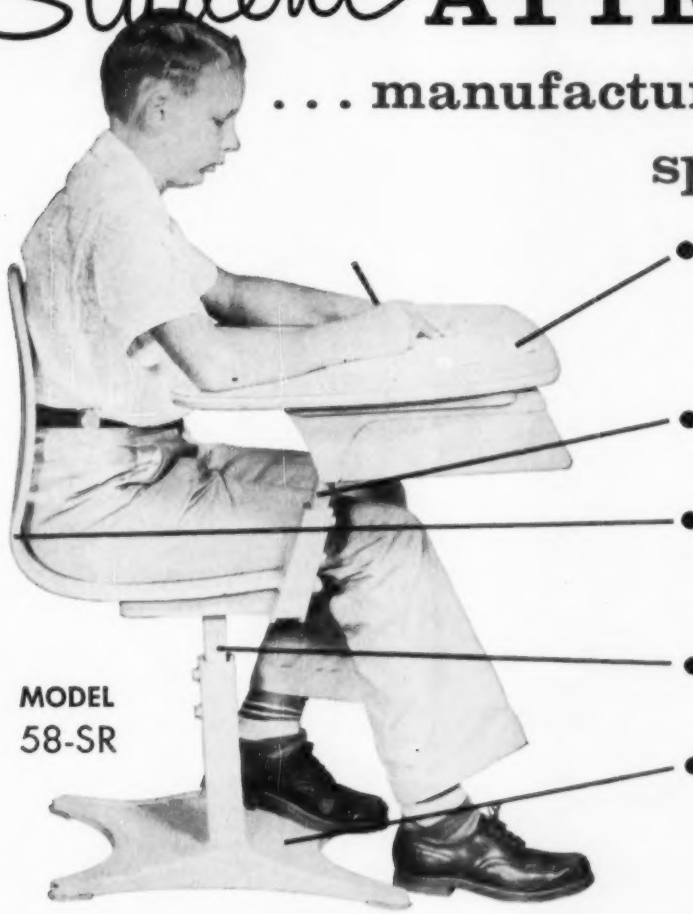
Student ATTENTION

. . . manufactured by specialists



MODEL 58-SR

- MAXIMUM WORKING AREA – The specially designed desk top gives the student a maximum working area and properly supports the arms – permitting reading and writing without awkwardly bending forward. Better posture is developed – alertness and attentiveness result!
- UP-DOWN-IN-OUT – A quick, positive adjustment raises or lowers the top – upward and outward, downward and inward – to suit each pupil comfortably.
- DISCOURAGE SLOUCHING – The semi-flexible Body-Contour Seat-Back encourages a straight, upright position and discourages slouching – reducing physical and mental fatigue that impedes proper learning.
- LIKE A GLOVE – The Seat-Back can be raised or lowered in seconds to fit students of all sizes – exactly. Correct, relaxed seating is assured!
- SLOUCH THE FEET – NOT THE MIND – The exclusive Offset Movable Pedestal allows full backward and forward leg movement – preventing cramped, frustrating positions that cause distraction.

MODEL 602-2

MODEL 57

Let us prove to you how *General* desks make your students want to pay attention.

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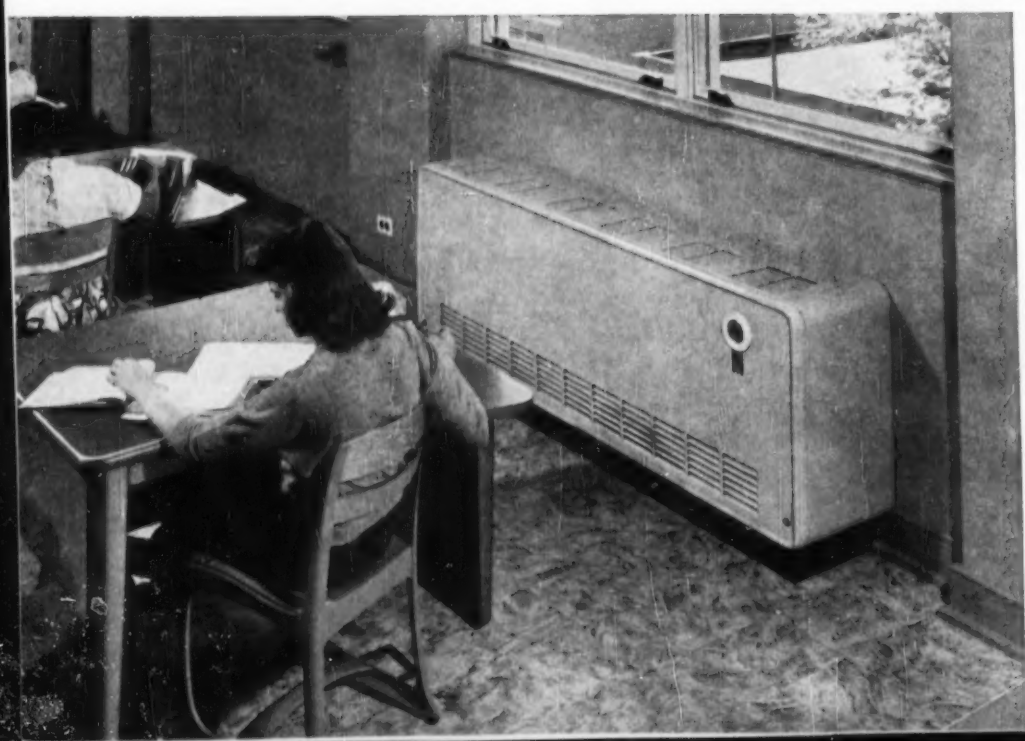
Progressive Denver School

Plans For Air

Emily Griffith Opportunity Shool, Denver, Colorado. Superintendent of Schools: Dr. Kenneth E. Oberholtzer; Architect: Jamieson & Williams; Engineer: Ken Murray.



HerNel-Cool Units in each room are now providing heating, ventilating, and natural cooling. Only the addition of a chiller in the boiler room is necessary for complete hot weather air conditioning.

Conditioning with HerNel-Cool

Simple chiller installation will add air conditioning to existing unit ventilator system.

Since its founding in 1916, the Emily Griffith Opportunity School in Denver, Colorado, has been a symbol of progressive thinking in education.

That same progressive thinking went into the planning of the school's modern four story addition, built in 1956. All classrooms and administrative offices are equipped with HerNel-Cool units which heat, ventilate and provide natural cooling with outside air. Only the addition of a chiller in the boiler room is needed for complete hot weather air conditioning. When it is wanted, air conditioning can be secured without disruption . . . and without expensive alteration and installation charges.

HOW THE SYSTEM WORKS

HerNel-Cool units provide individual temperature control for each room, automatically. Most of the year they provide heat, ventilation, or natural cooling (with outside air) as the room requires. When a chiller is installed in the boiler room, HerNel-Cool units also function as air conditioners. In hot weather, the units switch automatically to mechanical cooling, with chilled water circulating in the same piping that carries hot water during cold weather. The cost is far less than separate heating and air conditioning systems—both for installation and operation.

Thoroughly tested in hot, humid climates, HerNel-Cool units have exceeded every requirement. The system is flexible, too. Units can be installed now where they are needed most—the system can later be extended whenever you wish.

Would you like more information? We will be glad to send you our new 20 page book, "HerNel-Cool AIR CONDITIONER for Schools". Just write to Herman Nelson Unit Ventilator Products, American Air Filter Company, Inc., Louisville 8, Kentucky.

AAF herman nelson
UNIT VENTILATOR PRODUCTS

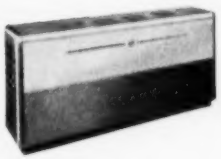
AMERICAN AIR FILTER COMPANY, INC.

American Air Filter Company, Inc., System of Classroom Cooling, Heating and Ventilating

Any Fuel
Any Climate

There is a Herman Nelson Unit Specifically Designed to Give You More Classroom Comfort Per Dollar

Flexibility will always be important to Herman Nelson—for there is no "one best" system to provide for heating, ventilating and cooling classrooms. The health and comfort of pupils and teachers come first. The design, structure and location of each school will indicate the most economical and practical system to achieve that ideal classroom atmosphere.



HOT WATER, STEAM
Herman Nelson Unit Ventilators with patented DRAFT|STOP control downdrafts without adding to the classroom heat load, provide ideal classroom climates.

GAS
New UNIvent Gas Fired Unit Ventilator provides all the health and comfort features of the DRAFT|STOP system in a completely self-contained unit.

MILD CLIMATES
AMERVENT built especially for schools in mild climate areas, provides fresh air cooling, heating and ventilating within the nominal cost of heating alone.

ELECTRIC
New Electric Unit Ventilator in which an electric heating element replaces the hot water or steam coil provides all DRAFT|STOP comfort features.

N.S.B.A. REPORT

The Research and Development Project

O. H. ROBERTS, JR.

Director, N.S.B.A. Research and Development Project

In the opinion of many people who are interested in public education, the period between 1945 and 1955 was an unusual one in many respects. Probably its most unusual feature was that during this decade more people actually became interested in their public schools than ever before. For the first time, in the opinion of many, public schools really became "public." The interest of citizens was manifest by the creation of many local and state citizen committees and local and state school boards associations.

At the national level the National Citizens Commission for the Public Schools and the National School Boards Association came into being. The climax was reached in the year 1955 when there were held, in this country, many hundreds of community conferences and state conferences on education; and in November of 1955, as called by President Eisenhower, the White House Conference on Education.

In the spring of 1956 the Board of Directors of the National School Boards Association decided that it was the appropriate time to take advantage of this newfound interest on the part of those citizens who were legally responsible for public schools, such as boards of education, and citizens generally. They also believed it was a good time to take a look at the organizational structure of the National School Boards Association and of their member state associations to the end that a more effective program for the improvement of public education could be accomplished. The Project Proposal Committee of the National School Boards Association, composed of Mrs. H. M. Mulberry of Chicago, chairman; O. H. Roberts, Jr., of Evansville, Ind., immediate past president; Cyrus M. Higley of Norwich, N. Y.; and Robert Willis of Bradenton, Fla., members of the board of directors, then considered the problems facing education, in so far as the National School Boards Association was concerned, and recommended to the board of directors a Research and Development Project.

The Project

The purposes of this Project, as set out by the committee were, in general, to analyze the major issues of education requiring action by responsible laymen, these to include an appraisal of what has been done and has not been done on such issues at all levels; to do the necessary research or have it done to determine educational needs and why these needs have not been met; to study effective action techniques used by groups other than education for methods of successful operation; to sample many states to determine educational needs and the barriers to meeting these needs; to study the effectiveness of the programs of state school boards associations and their needs and means of improvement; and finally, in the light of the findings in these areas, to study the responsibilities of the National School Boards Association for the improvement of public education. Upon the determination of these responsibilities, the Project would examine N.S.B.A. functions, co-operative relations, financing, and future program, the results of which would comprise recommendations to the board of directors. These purposes, as spelled out in more specific detail, were placed before the board of directors, and they in turn approved the Project, subject to its being financed. A proposal was made to the Fund for the Advancement of Education, and they in turn granted $65,000 to the National School Boards Association to finance the Project which is to be completed within a period of one year.

The board appointed O. H. Roberts, Jr., of Evansville, Ind., immediate past president, as director. The board also appointed a study commission composed of 19 members to serve as a policy-making body and advisory group for the Project. The commission is composed of the seven members of the Executive Committee of the National School Boards Association, presidents of three State School Boards Associations, the executive secretaries of three State School Boards Associations, as selected by the board of directors. The president or a delegated representative of the American Association of School Administrators, the National Education Association, the National Citizens Council for Better Schools, the National Congress of Parents and Teachers, the Council of Chief State School Officers, and the United States Office of Education are also members.

Upon the approval of the Project and the appointment of the study commission, a meeting was called in Chicago in July of 1956 for the commission to formulate plans and to define and limit the areas of the study. It was recognized very early that if the study was to be most effective, the problem of limitation and isolation of those areas most important to the study was the prime responsibility of the policies commission; and the July meeting was given over to this responsibility.

At the commission meeting, the study was divided into three rather simply stated areas, as follows:

1. What are the responsibilities of laymen, for the improvement of public school education and how do they best fulfill them?
2. What are the responsibilities of lay and professional groups organized primarily to improve education, to co-operate in accomplishing their objectives, and what are the successful techniques used in such co-operation?
3. What are the continuing responsibilities of the National School Boards Association for the improvement of public school education, and how should they be fulfilled?

It was agreed by the staff and the commission that the techniques for the study would include questionnaires, interviews, and conferences. Immediately following the commission meeting, the staff began preparation of several questionnaires, the first of which was an effort to obtain the names of persons to be contacted personally, persons, both lay and professional, who would also be contacted by letter in the event it was impossible to interview them. These names were obtained from commission members, State School Boards Association presidents, and executive secretaries. A mailing list of some 500 persons of widespread local, state, and national importance has been compiled, and a questionnaire has been developed and used with this group.

A three-part questionnaire was developed for the use of state presidents and executive secretaries. It was based principally upon the interpretation and analysis of board members' responsibilities in the various states; the evidence of their acceptance of responsibility; the methods, activities, and materials used by boards; their patterns of action; needed assistance from the National School Boards office and their thinking on the future program of the National School Boards Association. At the present time these questionnaires are being returned to the director's office.

(Concluded on page 16)

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Official Rectangular Backboard. ½" Herculite tempered glass cushioned in Neoprene. Sturdy metal frame. Medart also makes a ruggedly framed, thick plywood rectangular backboard, a favorite for practice.

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First, they're built right — rugged, durable, rigid, vibration-free — to provide the finest possible accurate, quick-bank playing surface.

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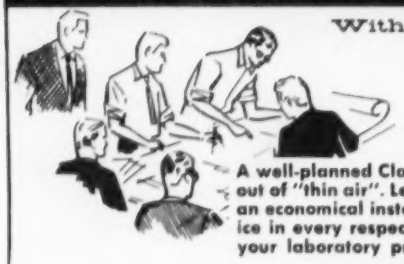

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☆ VERSATILE
☆ ADVANCED DESIGN
☆ LONG LASTING

A well-planned Classroom Laboratory does not materialize out of "thin air". Let the METALAB Engineering Staff design an economical installation which will render superior service in every respect. Do not hesitate to call on us to solve your laboratory problem without any obligation to you.

- Designed for interchangeability – which facilitates additions and modifications in accordance with future laboratory requirements.
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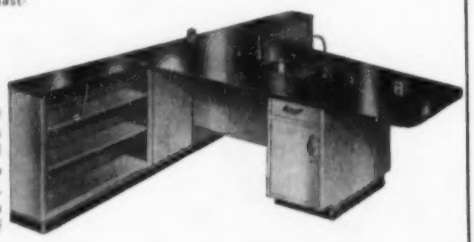
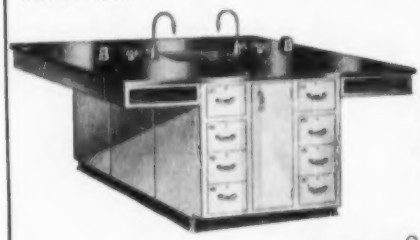
7000 Series ▷
Multi-Purpose Tables

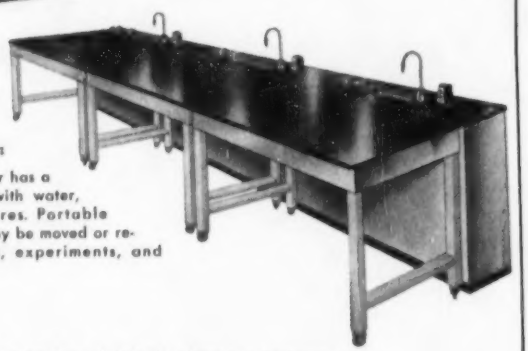
These units were designed so that Wall Base Cabinets and Storage Units may be combined into one integral group. This permits many students to work efficiently in a limited area. Open and Closed Storage Units can be interchanged with a variety of Base Cabinets.





◁ 5000 Series
Student Science Desks:

These units are ideal for a 4-Student-4-Class arrangement. Each student has easy access to all service fixtures, and is provided an individual drawer. The unobstructed working surface and handy notebook compartment allow for better experimental student work.



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This Laboratory Service Center has a fixed fittings service center with water, electric, gas, and air fixtures. Portable METALAB classroom tables may be moved or removed for demonstrations, experiments, and recitations.

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N.S.B.A. REPORT

(Concluded from page 14)

The project director, Mr. Roberts, and whenever possible the executive secretary of the National School Boards Association, Mr. Shannon, have spent a great deal of time and traveled many miles conferring with individuals and groups to obtain the best thinking possible on the various areas of the study. It was recognized in the very early stages of the study that, with the vast size and variation of our country, regional differences would also have their effect upon activities of citizen groups and lay and professional co-operation and also would have a marked effect upon the kind of programs that are necessary and most valuable for both State School Boards Associations and the National School Boards Association. With that in mind, a regional sampling has also been a part of the pattern of activity on the part of the director and of Mr. Shannon.

At this early date, of course, it is impossible to spell out the various conclusions and recommendations that will come from the study, but it became evident very early that many direct and indirect benefits would be derived from the procedures that have been used by the staff. It also was recognized very early that because of limitations on time, personnel, and money, a more detailed job of analysis and interview could not be done as has been preferred by a number of our leaders. For example, it would be very desirable to be able to go into all of the 48 states and do an individual analysis as to how board members are and are not accepting their responsibilities and the causes for that particular situation; but time and the other factors will not permit. However, the staff is finding that the questionnaires alone are giving to State School Boards Associations and other persons a very valuable opportunity for self-evaluation of their leadership and their program which should be of great future advantage.

A progress report was made by the staff to a combined meeting of the Policies Commission and the NSBA Board of Directors in New Orleans on November 24, 1956. An analysis of the techniques and procedures used to date brought forth a number of suggestions to the staff to permit them to strengthen the Project in the final stages. In addition, it was reported that the study is beginning to reveal many areas in which much work must be done to improve the quality of service of laymen and more particularly of school board members. Again and again the director has found, in interviews with both lay and professional leaders, a great amount of misunderstanding as to the responsibility of school board members for the improvement of the curriculum or educational program. In addition, there is much confusion between the relative responsibilities of the professional educator and the school board member in this particular area.

All in all, a great deal of extremely valuable assistance is being gained from the Research and Development Project. The splendid co-operation everyone has given to the staff will pay big dividends to state associations and the National School Boards Association, as well as to education generally.

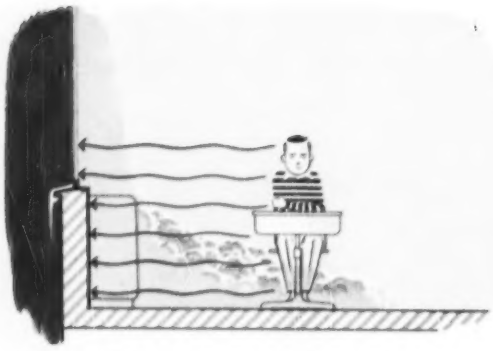
Essential reading for anyone planning a new school building

. . . reveals startling facts about the effect classroom thermal environment has on the learning process.

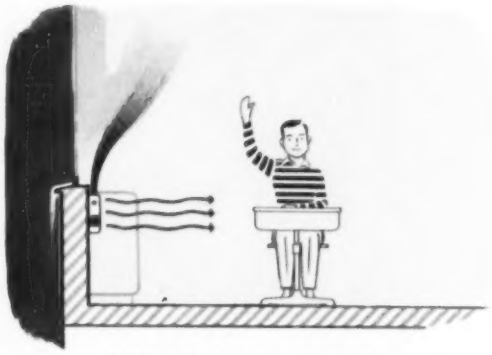
Before you buy classroom heating and ventilating equipment
you should read this big, new brochure . . .
it tells you how to obtain the protected learning environment
that will insure the *maximum yield from good teaching!*

Wind-o-line Radiation makes the difference!

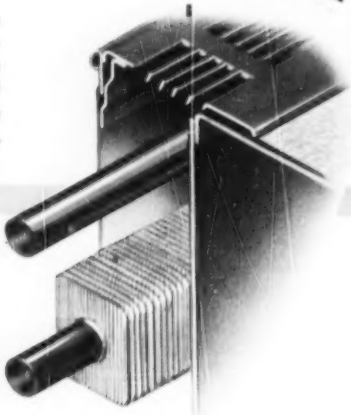
Indoor thermal comfort is related not only to room air temperature, but to the temperature of the surrounding surfaces as well.



Without Wind-o-line Protection, pupils seated near large windows are uncomfortable on cold days because they lose too much body heat to cold surfaces and are exposed to chilling downdrafts—even when the room air temperature is right.



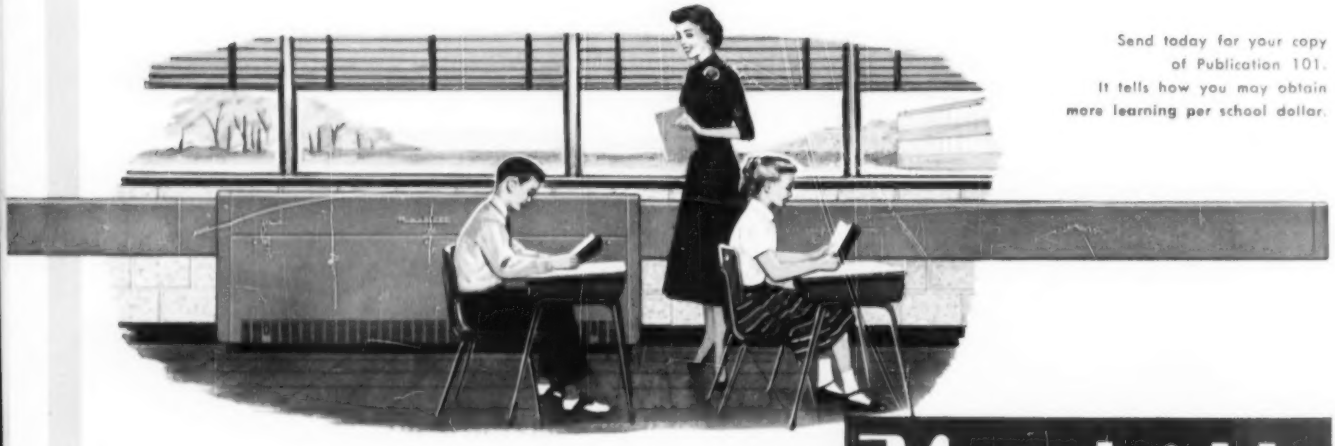
With Wind-o-line Protection, windows, outside walls and floor are warmed to offset the loss of body heat, and a rising blanket of heated air warms and diverts the chilling downdraft. Now all students sit in a *protected learning environment.*



Wind-o-line Radiation installed all along the cold window wall is the bonus feature in the Nesbitt system of heating, cooling and ventilating. Wind-o-line may be concealed by wall-hung enclosures or Nesbitt storage cabinets.

The Nesbitt Series Hot Water Wind-o-line System provides *the protected learning environment at proven lower costs.* You save through: elimination of costly pipe trenches, runouts and pipe covering; smaller pipes and pumps; factory installed piping in the unit ventilator.

The Added Protection of Wind-o-line Radiation Increases the Yield of Good Teaching



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CLASSROOM HEATING AND VENTILATING EQUIPMENT BY **Nesbitt**

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Permissible Procedures in Construction Contracts

STEPHEN F. ROACH

Editor, **Eastern School Law Review**, Jersey City, N. J.

Probably the single most important responsibility facing American school boards today relates to insuring that the physical school plant is adequate for a worthwhile educational program.

And certainly, one of the more critical aspects of that responsibility is concerned with the varied procedures — some mandatory, some permissive — which a board is expected to follow when it proposes to award a contract for the construction of a new school building or the alteration of an existing one.

A significant decision[1] affecting this phase of school board operations was recently handed down in the Superior Court of New Jersey.

Facts of the Case

The East Orange, N. J., board of education, planning to erect an addition to its Elmwood School, solicited bids in November, 1955, for such work. Bids were sought for the general construction and, alternately, for the demolition (entitled "Alternate GC-1") of a part of the existing building.

Four bids were received on the general construction; the low bid of $396,700 being submitted by A. A. La Fountain, Inc. Of the four bids received on Alternate GC-1, the La Fountain bid of $38,000 was the highest; the low bid here was $12,500.

On December 19, 1955, the board passed a resolution awarding the general construction work to La Fountain, as the lowest bidder. At this meeting the board also resolved to reject "Alternate No. 1 under the General Construction specification concerning the demolition." In the same resolution, the board authorized its architect "to prepare new specifications for the demolition," and authorized the board secretary "to advertise for bids."

In accordance with this resolution, and after the readvertising, bids for the demolition were received on January 5, 1956, from Edward J. Rose, Inc. (for $29,500) and from Gibraltar Wrecking and Supply Co. (for $37,000). At a meeting on January 16, 1956, on motion, the board rejected both of these bids and accepted the original La Fountain bid (for $38,000) as it had been originally presented at the December 19 meeting.

Thereupon the Edward J. Rose company brought suit to prevent the board from awarding the contract for the proposed addition to La Fountain. In its reply the East Orange board of education contended that Rose had no standing to prosecute since, as a mere unsuccessful bidder, he could not challenge the award of a contract to a rival bidder.

The Issues

The fundamental issue in this case might be stated as follows: May a board of education reject all of the original bids received on an alternate to a general construction contract, readvertise for additional bids on the same alternate, reject the additional bids so received, and then award the alternate contract to the general contractor who had not bid on the readvertising? Also, this firm's bid on the alternate — one of those previously rejected — was for an amount higher than one submitted as a result of the readvertisement?

Findings of the Court

The court first pointed out that the board of education reserved the right to reject any and all bids for which it had advertised, and that it had exercised this right at the December 19 meeting.

But the court then noted that by its motion authorizing its architect to prepare new specifications for the demolition — which motion was also passed on December 19 — the board had thereby demonstrated "that Alternate GC-1 was not an integral part of the general construction contract."

The opinion then commented that up to the time the readvertised bids on Alternate GC-1 were received and opened, "it was probably within the power of the board . . . to have reconsidered its action of December 19" — wherein it had rejected the four bids on Alternate GC-1 — "[and to have awarded] the contract to the lowest responsible bidder among them, but it did not elect so to do."

Significantly, the court then added: "The situation changed after . . . Rose . . . and Gibraltar . . . had submitted bids in response to the [re]advertisement . . . [and] the bid was found to be the lower of the two bids received. . . ." For then, Rose had a "vested interest, subject only to being defeated if it was found that [he] was not the lowest responsible bidder. . . ."

In this latter connection, it will be noted that there had been no finding that Rose was not responsible. Here, the court was quick to point out that "in order to find that a lowest bidder is not responsible, it is incumbent upon the board of education to make such a finding in the exercise of a bona-fide discretion after investigation upon notice and hearing to the bidder affected."

Returning to the board's action of January 16 — when it had accepted the La Fountain bid (which it had previously rejected on December 16) — the opinion said: "The attempted action to revitalize the four bids on Alternate GC-1 . . . was beyond the power of the board . . . in light of the . . . [board's] . . . conduct [on December 19] which . . . clearly [indicated] that they considered Alternate GC-1 not an integral part of the construction contract. . . ."

Deciding that the board's right to rescind the rejection of the earlier bids on Alternate GC-1 was lost when the bids on the second advertisement were opened, the opinion held that to permit the January 16 board action — whereby it had rejected the Rose and Gibralter bids and accepted the earlier La Fountain bid — "would fly in the philosophy behind the statutory regulation requiring competitive bidding."

The opinion concluded: "[If] the board of education, on reconsidering, believed it better to deal only with a general contractor, it had the right to change its mind, but only on condition that it readvertise for the bids for general contractors only."

Therewith judgment was entered against the board of education. However, the court postponed actual entry of the judgment for "a reasonable length of time" to permit the board, on notice to the bidder, to investigate the question of whether or not Rose "is a responsible bidder."

Significance of the Case

It would appear that the following legal principles were validated by the court's decision in this case:

First: A school board has the right to reject any and all bids received on an alternate to a construction contract, and to readvertise for additional bids.

Second: A board may reconsider a previous rejection of all bids received on an alternate to a construction contract, so

(Concluded on page 90)

[1] *Edward J. Rose, Inc.* v. *Bd. of Educ. of East Orange and A. A. La Fountain, Inc.*; cited as 121 A. 2d 549 in the West *National Reporter System*.

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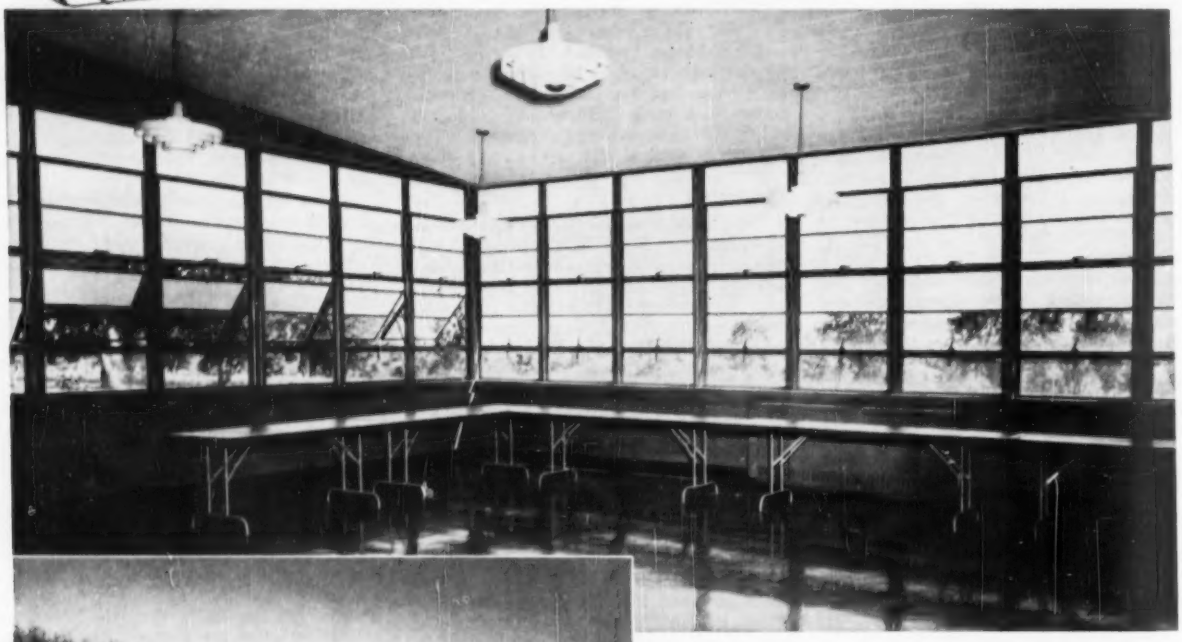

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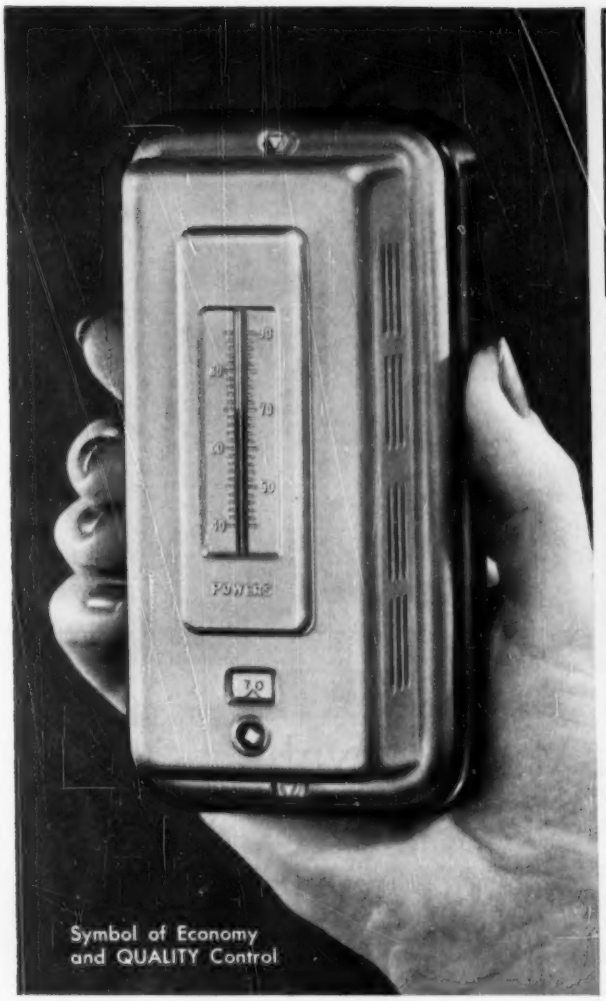

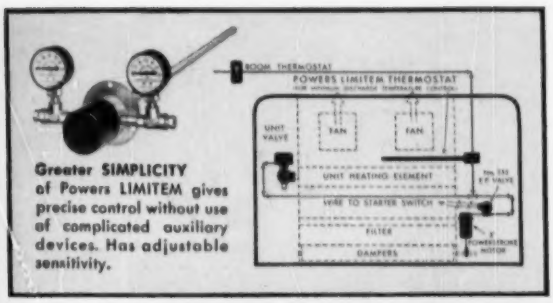

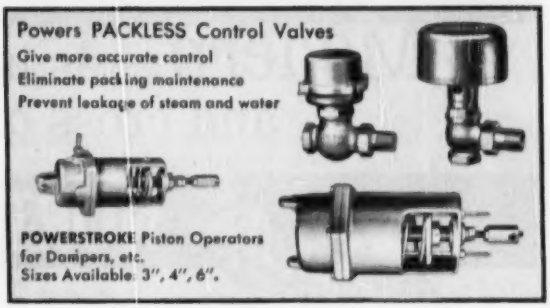
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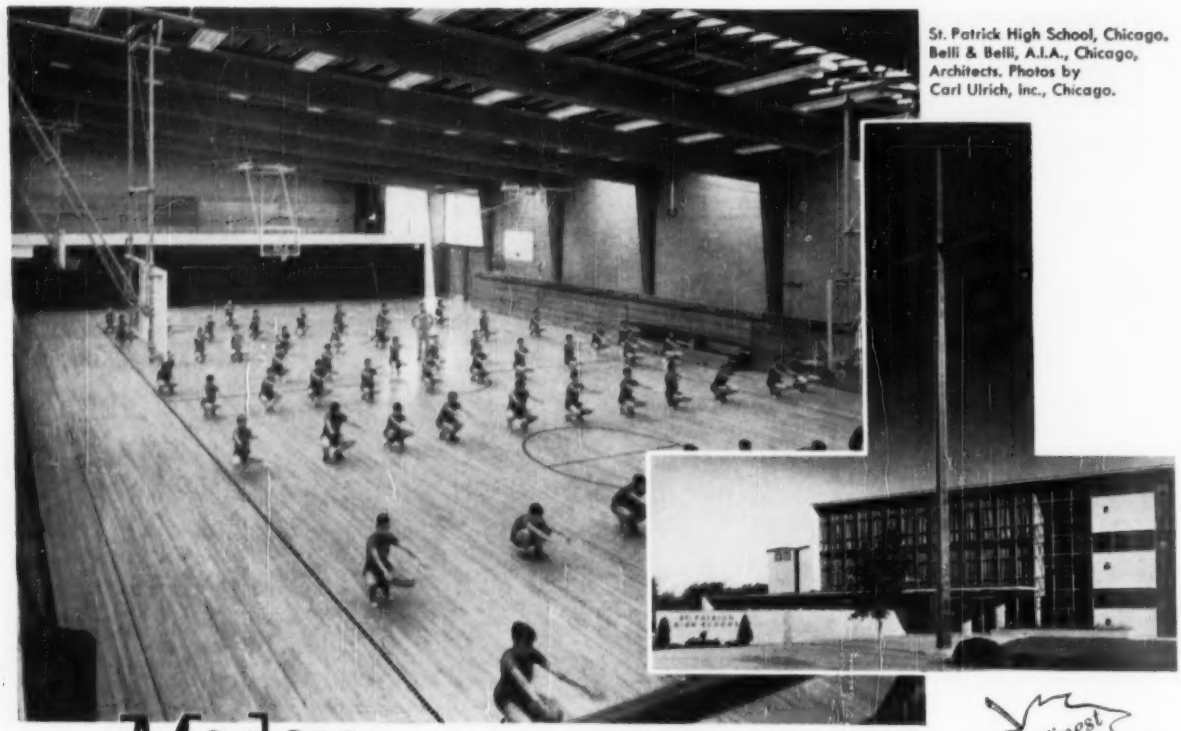

St. Patrick High School, Chicago. Belli & Belli, A.I.A., Chicago, Architects. Photos by Carl Ulrich, Inc., Chicago.

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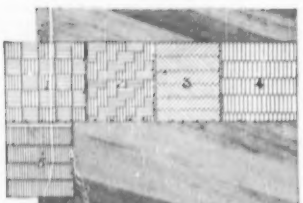

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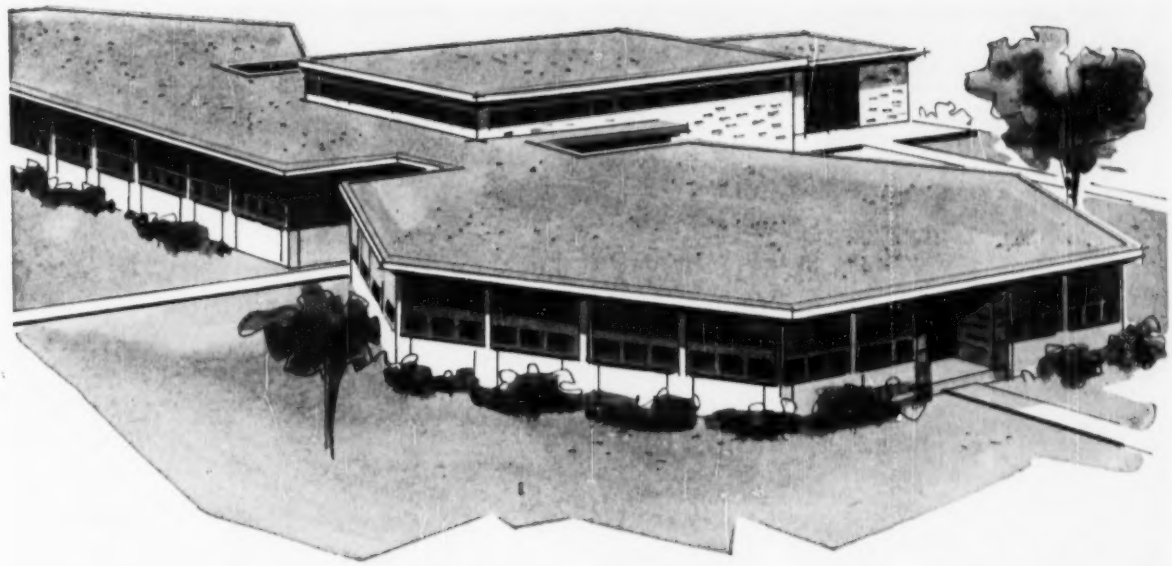

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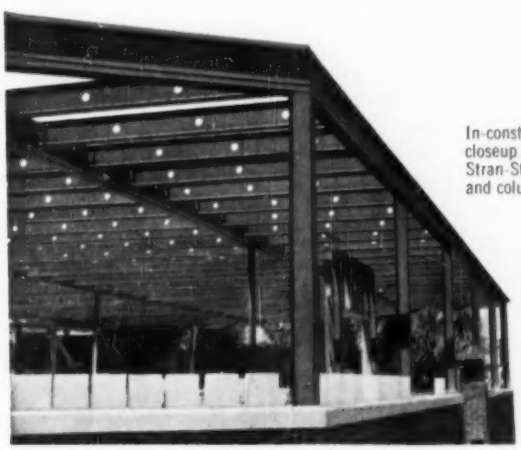

In-construction closeup of Stran-Steel joists and columns.

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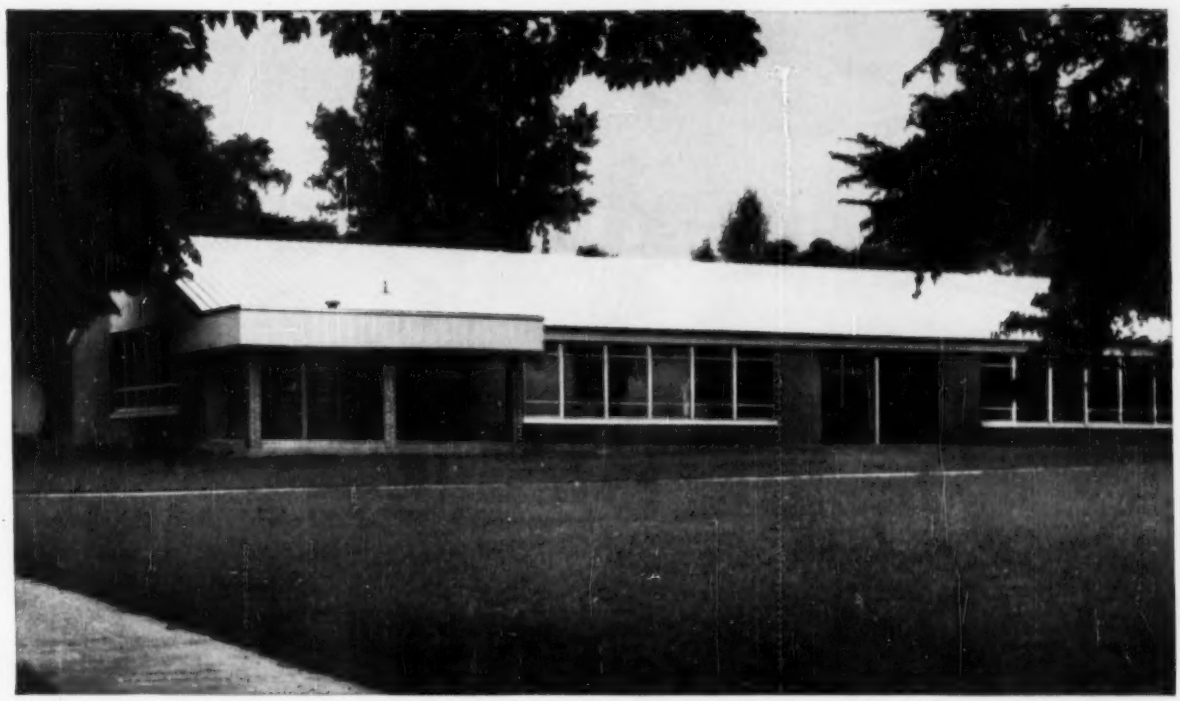

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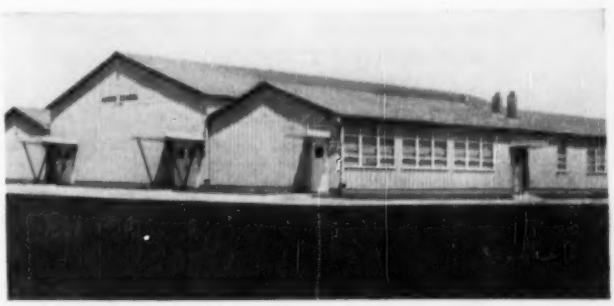

Rankin School near Pekin, Illinois, that uses all metal walls for maximum economy. Interior consists of four classrooms, a kitchen, a gymnasium and five additional rooms.

Classroom in Maple Dale Elementary School, Milwaukee, Wis., showing installation of new Acousti-Celotex Steel-acoustic® Panels. Architects: Fritz von Gressmann. Acousti-Celotex Contractor: Edward T. Ver Halen, Inc.

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THE AMERICAN
School Board Journal
A Periodical of School Administration

JANUARY - - - - - - - - - 1957

THE SCHOOL SITE

Selection and Development of the School Site

GARFIELD B. NORDRUM

Director, State School Construction Fund
Department of Public Instruction, Bismarck, N. Dak.

The selection and the development of the school site is as basic to good school planning as is the foundation of the school building itself. It can be the *plus* or *minus* in determining the success of school plant facilities.

Size and Shape

The trend in recent years has been to regard the school grounds as more than a plot on which to place the school building or buildings. The site is now recognized as a recreational area which is important to the children, and as a community center which can make effective use of school facilities and provide diversified programs for varied interests and needs. In our "Manual for North Dakota School Buildings," June, 1956, we have set up minimum standards of not less than five acres for the elementary school with at least one additional acre for each 100 children. For example, an elementary school with an enrollment of 200 children should have the basic five acres, with one additional acre for each 100 children, or a total of seven acres. For a combination elementary and high school building, the basic requirement is 10 acres, with one additional acre for each hundred pupils enrolled, or for an enrollment of 200 pupils the minimum school site should be at least 12 acres.

We emphasize that it is well to purchase a sufficiently large site in advance of the actual construction to assure an adequate site for future expansion. Excellent guides in planning space locations and areas needed for foreground, recreation, service, and sports are "A Guide for Planning Facilities for Athletics, Recreation, Physical and Health Education," published by the American Association of Health, Physical Education and Recreation, Washington, D. C., and "Standard Sports Areas," published by the National Industrial Recreation Association, 203 North Wabash, Chicago 1, Ill. We feel that the most suitable site is the one which is rectangular in shape in a ratio of approximately three to five and which will need limited grading.

Location

The location of the school site is important with relationship to community growth, long-range planning of additional sites, and other community facilities, such as, parks, recreation centers, streets, highways and other hazards, public utilities, libraries, and health.

Development

The basic considerations in site development should be carefully planned with the architect and should include: (1) the approach or foreground of the building area; (2) the recreational areas for school and community uses; and (3) the service areas. The guiding principle should be that no one area is independent of the other areas, but that each area is an integral part of of the over-all plan for the development of the site. Simply stated, this means that site development is dependent upon preliminary planning, co-operative planning, and long-range planning as follows:

1. *Approach or Foreground of Building Area.* Plan the approach and orientation of the site in relationship to the building, future additions and future buildings. Plan the landscaping from the beginning with a co-ordinated plan. Plan the roads, walks, drives, and elementary and secondary areas on the site plan according to scale. Provide for pupil loading and unloading areas with relationship to traffic and safety considerations. Provide for bicycle racks and waste paper and trash receptacles for the development of proper attitudes, such as neatness, orderliness, and school pride.

2. *Recreational Areas.* The recreational areas should be large enough to provide space for all age groups, such as the primary, intermediate, upper elementary or junior high, and senior high. Multiple-use of the recreational areas can be provided in certain schools through scheduled use of the facilities. The arrangement and location of drives, parking areas, walks, foot lanes, and of

the recreational areas are important from the standpoint of safety, and every precaution should be considered and included in the layouts to avoid traffic hazards. It is well to plan the recreational areas with relationship to toilet facilities, dressing and shower rooms, indoor and outdoor drinking fountains, and hose connections for the watering of turf, garden, and other areas. The hose and hydrant connections are important for the effective use of certain areas for winter sports.

3. *Service Areas.* Walks should be not less than five feet in width and should be well lighted. The immediate sidewalk approaches to the school entrances should be doubled or tripled in width, depending upon the traffic to be handled by the entrance. Parking areas should be planned for (1) teachers, employees, and students; for (2) salesmen, parents, and visitors; and for (3) sports spectator groups. The last mentioned should be near the gymnasium. This area may be used as a surfaced playground when not in use for spectator parking. All parking areas should be well lighted. The exit and entrance drives should be well marked with adequate directions to assure safety. All drives and parking areas should be planned and laid out to avoid foot traffic crossings.

Acquisition of Site

Many states provide for the manner in which a school district shall procure a school site. In North Dakota there are two methods, one for the common school district (three-member board) which is for the most part in the rural areas, and one for the special school district (five-member board) which includes an incorporated village or city.

1. *Common School District.* The common school district board must hold an election to select a site. This election requires a 14 day notice and a simple majority of the voters who vote upon the question.

2. *Special School District.* The special school district board is empowered by law to select and to purchase a school site upon its own motion and a majority vote upon the question.

Physical Properties

The physical properties of the site to be considered are the soil conditions, the contour, and the elevation. The subsoil should be tested for suitable drainage and the proper base to support the building. In certain areas it may be necessary to test at rather close intervals. Top soil conditions are important for the success of the landscaping plans. If the site is level, the cost of the development may be held to a minimum. If the site is not level, it is desirable to design the building to make use of the contours so as to reduce excessive grading and maintenance costs. Playgrounds, recreational areas, and planting areas should be graded to provide adequate drainage and to avoid erosion. The elevation of the site is important with relationship to adjacent properties, water table, rivers, valleys, sewage disposal systems, and related problems.

Do's

1. Allow enough money for balanced site development.

2. Emphasize the planning of recreational facilities for all ages of pupils, and for community use.

3. Subdivide the recreational area to provide for:

a) Elementary
   1) Very small children
   2) Paved court area for rainy weather
   3) Boys' games
   4) Girls' games

b) High School
   1) Paved court
   2) Boys' games
   3) Girls' games
   4) Interschool athletics.

4. Level site according to over-all plan and terrace hilly terrain for individual play courts.

5. Avoid the use of cinders and gravel for playground surfaces.

6. Provide for good drainage through proper grading.

7. Properly prepare the soil for planned planting.

8. Provide a paved or hard-surfaced area for winter, spring, and rainy days.

9. Plan the location of trees, shrubs, and lawns to provide beauty, to subdivide activity areas and to provide shade, but to keep shade trees away from classroom windows.

10. Locate the building back somewhat from the sidewalk to provide a dignified setting, quieter classrooms, and a safer approach.

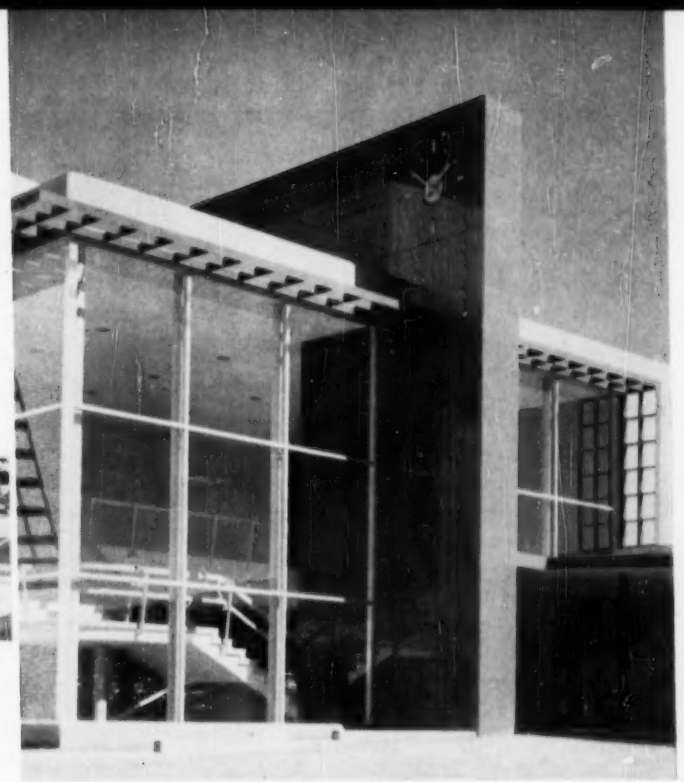
11. Keep the development of the grounds informal in character and do not overplant.

12. Score the proposed sites under consideration on the basis of a 100 per cent scale.

SITE SCALE

	Standard	Site 1	Site 2
A — Physical Characteristics (40 points)			
1. Amount of usable land	15		
2. Adaptability of shape, contour, and orientation to needs	10		
3. Elevation and drainage	10		
4. Character of soil	5		
B — Environment (25 points)			
1. Cleanliness and quietness of surroundings, general attractiveness	13		
2. Freedom from nearby hazards (railroads, airports, through highways, etc.)	12		
C — Accessibility (20 points)			
1. Safety and convenience of approach	10		
2. Centrality in contributing area	6		
3. Convenience for community use	4		
D — Services (15 points)			
1. Electricity	8		
2. Drinking water	4		
3. Water pressure	1		
4. Sewage facilities	1		
5. Fire protection service	1		
Total	100		
Cost			

Evaluating a proposed school site by the point system incorporated in this scale will reveal a site's advantages and weaknesses.



Northwest Classen High School

Designed for the "intellectual, social, emotional, moral, and physical development" of its students, this comprehensive high school represents the product of exhaustive, co-operative research . . .

N. L. GEORGE

Assistant Superintendent, Oklahoma City, Okla., Schools

The entrance to the physical education department of the Northwest Classen high school, Oklahoma City, Okla.— Hudgins, Thompson, Ball, and Associates, architects and engineers, Oklahoma City. Dr. J. Chester Swanson is superintendent there.

The basic needs which conditioned the design of Oklahoma city's Northwest Classen high school are those of properly inducting the young people into the life of our society; namely, intellectual, social, emotional, moral, and physical development. Furthermore, the building layout was designed to meet the needs of the adult groups of the community.

The determination of these needs was resolved by a careful study of the functioning of the present high school programs and building facilities, the faculty, and professional personnel of the school system. The board of education sent its professional personnel and the building's architects to more than 40 schools with similar programs in seven states to study the practices used in designing and constructing high schools. Also, the latest studies in the field of school program and school plant construction were carefully reviewed to discover trends.

Typical of the 72 classrooms in this comprehensive city high school is the one shown at the left. The classrooms have asphalt tile floors, sand finished, painted plaster walls, and acoustical tile ceilings. A view of the library is shown below.

The study revealed that this program would require a great number of diverse spaces. First of all, the size of the school site was 38.5 acres. Then, space for guidance, instructional materials, administrative and instructional and service staffs, and school building service facilities would be needed to supplement the needed curriculum.

Northwest Classen high school was planned for 2500 students and 97 teaching stations. If necessary, the building is planned so that it can be expanded to house 3000.

Construction Materials

The attractive structure, facing southwest for its main exposure, is in the form of a square with a large inner court. The classroom section is two stories, and the shop area, one story high. The walls are mainly brick and glass. Double-hung aluminum windows provide the exterior fenestration. Steam heat supplied by unit ventilators assists in the heating and ventilation of the building. The building is equipped for zone heating of large functional units. Specific areas have automatic controls.

Ultimate-Size Building Summary of Space Areas

	Square Feet	*Percentage per Class*
I. Areas for instruction	145,429	58.28
II. Administrative, health, teacher planning, food service, storage, heating, and toilets	37,769	15.13
III. Corridors, stairs, and foyers	53,042	21.25
IV. Partitions	13,318	5.34
Total	249,558	100

Exterior: The entrances are glass, with aluminum trim. The accent at the main entrance is a pylon of red granite with a two-dial clock. The walls are light gray brick with vertical and horizontal architectural concrete fins.

Instructional Areas: The basic consideration was to construct areas to house a broad and comprehensive curriculum which is largely preparatory. Eighty-five to 90 per cent of the students will attend college after graduation. The classrooms are interchangeable and are varied in size for English, history, and mathematics. Other instructional centers are for art, journalism, home training, business, speech, distributive education, and other commercial occupations. Special features in these areas are movable cabinetwork in the English, art, and social science rooms. Continuous rows of low brightness fluorescent lighting fixtures maintain high brightness.

Three outside classrooms were provided adjacent to the inner court area which may be used for instructional activities and social programs.

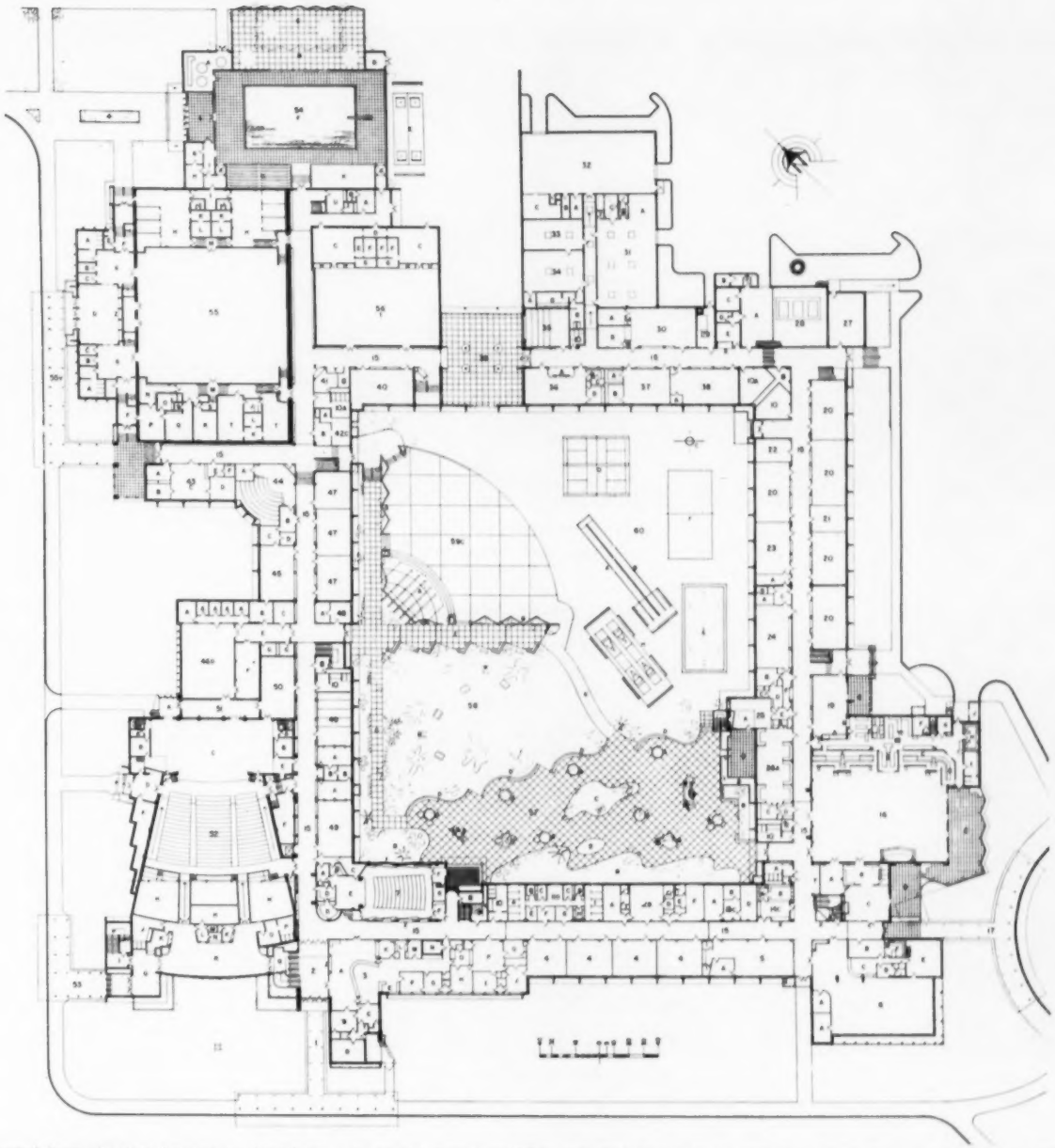
Of special interest is the home training unit. Areas included are sewing instruction with adequate tote trays and full length mirror, model bedroom, model bathroom, make-up area, living room with a fireplace located adjacent in the inner court, a six-unit kitchen; each unit has different colored equipment, and laundry units.

Music Areas. The band area is located at the rear of the auditorium, with an outside entrance. The floor is equipped with a movable stage which seats 150 students. This area has four individual (accommodating one to three persons) and one large (accommodating eight to ten persons) practice rooms, storage for instruments, storage for band uniforms, music library, and small office. A music theory room is located between the band and vocal music area.

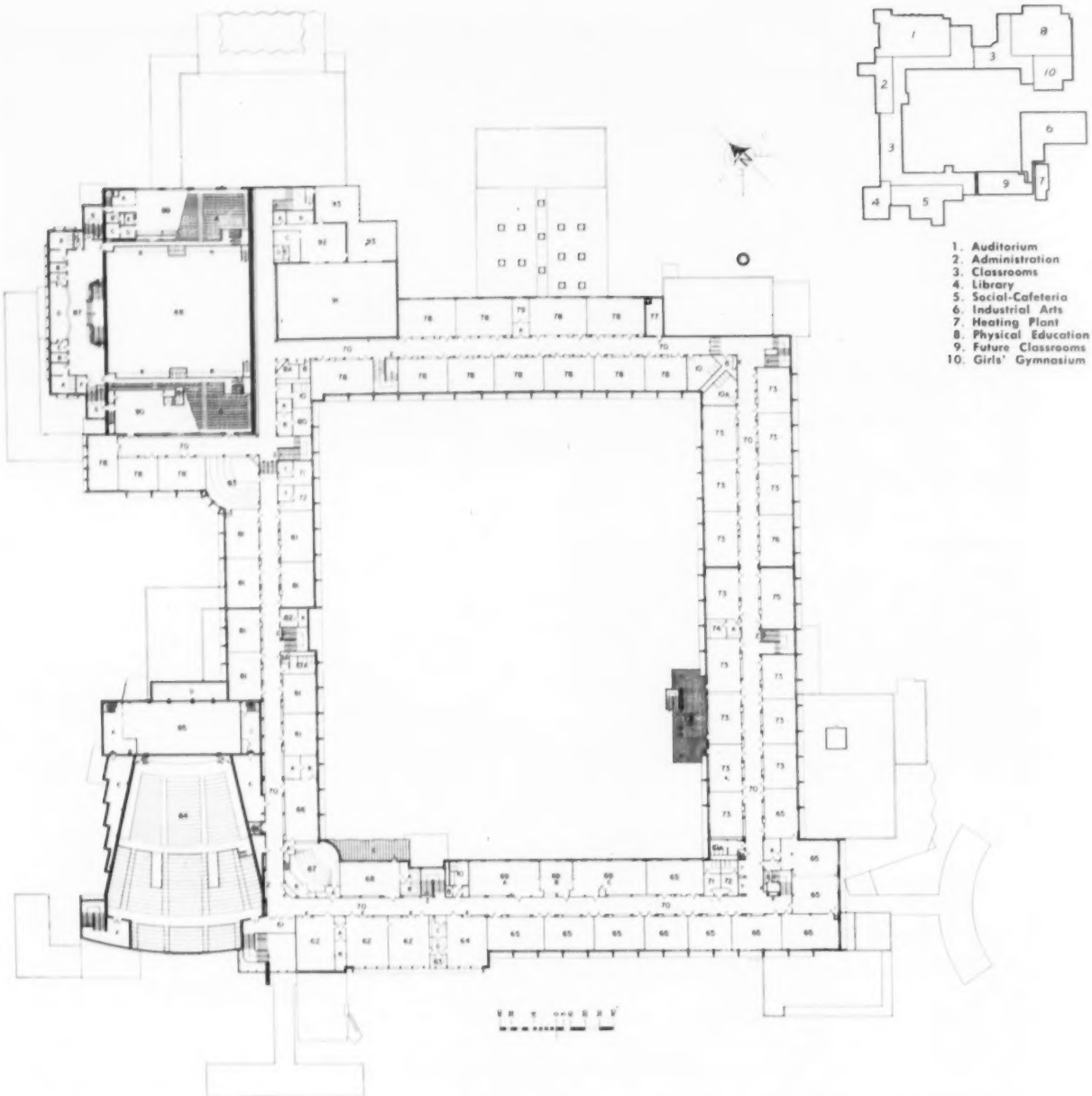
The vocal music area has elevated seats for 100 students, office, adequate storage, music library, and space for choir uniforms.

Science Area. This suite has a special science lecture room with raised platforms for seats, a chemistry room, a physics room, three biology rooms, a solarium, and a geology room. New around-the-wall science equipment is provided.

Library. The space has a southeast exposure. The windows are protected from natural sunlight by a roof overhang and



(1) Covered Ramp; (2) Main Entrance; (3) Administration, *a.* Reception, *b.* Principal's Office, *c.* Secretaries Office, *d.* Conference Room, *e.* P.B.X., *f.* Vice-Principal's Office, *g.* Communication Office, *h.* Boy's Council Office, *i.* Girls' Council Office, *j.* Test Council Office, *k.* Finance Office, *l.* Mail, *m.* Work Room, *n.* Vault, *o.* Registration, *p.* Reception, *q.* Student Conference. **(4) Classroom; (5) Student Activities,** *a.* Director's Office. **(6) Library,** *a.* Conference Room, *b.* Library Science Classroom, *c.* Checking Counter, *d.* Library Office, *e.* Stock Room, *f.* Work Room. **(7) Little Theatre,** *a.* Director's Office, *b.* Radio, *c.* Radio Engineer, *d.* Dressing Room, *e.* Stage, *f.* Entrance, *g.* Projection Room. **(8) Custodian's Work Room; (9) Custodian's Office; (10) Boys' Toilet; (11) Infirmary,** *a.* Boy's Ward, *b.* Toilet, *c.* Examination Room, *e.* Faculty Room, *f.* Boys' Waiting Room, *g.* Girls' Waiting Room, *h.* Laboratory, *i.* Girls' Ward. **(12) Faculty Lounge,** *a.* Men's Faculty Lounge, *b.* Faculty Planning Room, *c.* Kitchen, *d.* Storage, *e.* Powder Room, *f.* Women's Faculty Lounge. **(14) Student Store,** *a.* Storage, *b.* Counter and Display, *c.* Public Area. **(15) Corridor,** *w.* Bulletin Board, *x.* Showcase, *y.* Soft Drink Bar, *z.* Trophy Case. **(16) Social Center,** *a.* Storage, *b.* Vestibule Coat Room, *c.* Lounge, *d.* Terrace, *e.* Dining Terrace. **(17) Covered Passage; (18) Kitchen,** *a.* Serving, *b.* Dish Washing, *c.* Serving, *d.* Exterior Serving, *e.* Food Preparation, *f.* Dietitian's Office, *g.* Refrigerator, *h.* Storage, *i.* Employees Dressing Room, *j.* Garbage. **(19) Teacher's Cafeteria,** *a.* Serving, *b.* Dish Washing, *c.* Terrace. **(20) Classroom; (21) Practice Office; (22) Commercial Department Office; (23) Child Care Classroom,** *a.* Observation room. **(24) Sewing Classroom,** *a.* Fitting Room, *b.* Dressing Room, *c.* Office. **(25) Model House,** *a.* Living Area, *b.* Bedroom, *c.* Toilet, *d.* Grooming Room, *e.* Passageway, *f.* Entry, *g.* Porch. **(26) Home Economics,** *a.* Cooking, *b.* Storage, *c.* Laundry, *d.* Utility. **(27) State Text Storage; (28) Heating Plant,** *a.* Repair and Service Balcony, *b.* Yard Tools, *c.* Storage, *d.* Toilet, *e.* Engineers. **(29) Incinerator; (30) Mechanical Drawing,** *a.* Blueprint, *b.* Office and Conference Room. **(31) Woodwork Shop,** *a.* Lumber Storage, *b.* Tools, *c.* Finish Room. **(32) Auto Mechanics; Sheet Metal and Machine Shop,** *a.* Storage, *b.* Tools, *c.* Drawing Room. **(33) Printing Shop; (34) Graphic Arts,** *a.* Storage, *b.* Dark Room. **(35) Lecture Room; (36) Distributive Education,** *a.* Exhibit, *b.* Storage, *c.* Storage, *d.* Conference and Office. **(37) Diversified Occupations; (38) Commercial Occupations,** *a.* Office. **(39) Covered Passage; (40) Classroom; (41) Maid's Office; (42) Physical Education Administration,** *a.* Toilet, *b.* Outer Office, *c.* Physical Education Director's Office. **(43) Journalism Department,** *a.* Office, *b.* Editing, *c.* Work Area, *d.* Editing, *e.* Production Director, *f.* Storage. **(44) Choral Room,** *a.* Robe Storage, *b.* Sound Lock, *c.* Music Office and Library, *d.* Recording Room. **(45) Music Classroom; (46) Band and Instrumental Music Department,** *a.* Practice Room, *b.* Director's Office and Library, *c.* Uniform Storage, *d.* Assembly Room, *e.* Sound Lock and Passage, *f.* Instrument Storage, *g.* Toilet. **(47) Classrooms; (48) Music Department Office,** *a.* Supply and Storage. **(49) Speech Classroom,** *a.* Stage, *b.* Dressing Room. **(50) Stage Craft Class and Work Room; (51) Prop and Storage Passage; (52) Auditorium,** *a.* Toilet, *b.* Dressing Room, *c.* Stage, *d.* Exit, *e.* Exit, *f.* Mechanical Equipment Room, *g.* Elevator, *h.* Mechanical Equipment, *i.* Stair Exit, *j.* Men's Public Toilet, *k.* Check Room, *l.* Office, *m.* Vault, *n.* Tickets, *o.* Powder Room, *p.* Women's Toilet, *q.* Public Entry, *r.* Lobby. **(53) Covered Passage; (54) Swimming Pool,** *a.* Mechanical Equipment, *b.* Covered Terrace, *c.* Open Terrace, *d.* Yard Implement Storage, *e.* Horseshoes, *f.* Pool, *g.* Office, *h.* Supply Room, *i.* Passage, *j.* Entrance, *k.* Bleachers. **(55) Boys' Physical Education,** *a.* Public Toilet, *b.* Equipment, *c.* Ticket, *d.* Entrance Lobby, *e.* Passage, *f.* Exit, *g.* Public Foyer, *h.* Boys' Dressing Room, *i.* Passage, *j.* Toilets, *k.* Drying Room, *l.* Showers, *m.* Passage, *n.* Equipment Storage, *o.* Dressing Room, *p.* Coaches' Office, *q.* Training Room, *r.* Laundry, *s.* Storage, *t.* Team Dressing Room, *u.* Physical Education Office, *v.* Covered Passage. **(56) Girls' Gymnasium,** *a.* Physical Education Office, *b.* Toilet, *c.* Girls' Dressing Room, *d.* Passage, *e.* Drying Room, *f.* Showers, *g.* Toilets, *h.* Equipment, *i.* Gymnasium. **(57) Paved Terrace and Outdoor Lounge,** *a.* Tree Box, *b.* Planter Box, *c.* Planting Area, *d.* Serpentine Walls and Seats, *e.* Band Shell Passage, *f.* Memorial, *g.* Walkway. **(58) Park and Picnic Area; (59) Outdoor Stage,** *a.* Band Shell, *b.* Planters, *c.* Seating Area. **(60) Recreation Area** *a.* Bowling, *b.* Boccie, *c.* Tether Tennis, *d.* Badminton, *e.* Horseshoes, *f.* Volley Ball, *g.* Croquet, *h.* Shuffle Board.



(61) Balcony; (62) Biology Classroom, *a.* Office, *b.* Work Room, *c.* Work Room, *d.* Office. **(63) Greenhouse; (64) Geology Classroom; (65) Classroom; (66) Physics Classroom,** *a.* Stock Work Room, *b.* Office. **(67) Science Department Lecture Room,** *a.* Entrance, *b.* Projection Room. **(68) Chemistry Classroom,** *a.* Office, *b.* Stock Work Room, *c.* Outdoor Classroom. **(69) Art Department,** *a.* Classroom, *b.* Library and Display Room, *c.* Sculpture and Ceramics Classroom. **(70) Corridor; (71) Men's Faculty Lounge; (72) Women's Faculty Lounge; (73) Classroom,** *a.* Outdoor Classroom. **(74) Social Science Conference Room,** *a.* Office. **(75) Bookkeeping Classroom; (76) Shorthand Classroom; (77) Incinerator and Refuse Chute; (78) Classroom; (79) Office,** *a.* Outer Office. **(80) Office,** *a.* Storage, *b.* Outer Office. **(81) Mathematics Classroom; (82) Stock Work Room,** *a.* Office. **(83) Lecture Room; (84) Upper Auditorium; (85) Upper Stage,** *a.* Pin Rail and Work Area, *b.* Control Panel, *c.* Dressing Rooms, *d.* Upper Prop Storage Room, *e.* Mechanical Equipment Room, *f.* Exit. **(86) Elevator; (87) Concessions Area,** *a.* Public Toilet, *b.* Mechanical Equipment, *c.* Supply Room, *d.* Counter, *e.* Concessions Life, *f.* Custodian, *g.* Exit. **(88) Upper Gymnasium,** *a.* Permanent Seats, *b.* Folding Seats. **(89) Wrestling Room,** *a.* Dressing Room and Lockers, *b.* Office, *c.* Shower, *d.* Drying Room. **(90) Game Room; (91) Upper Girls' Gym; (92) Girls' Corrective Gym,** *a.* Office, *b.* Equipment Room, *c.* Dressing Room, *d.* Private Showers, *e.* Private Toilet. **(93) Open Air Gym.**

vertical fins. One library classroom and two conference rooms are located adjacent to the main library room. There is stack storage for 25,000 books. A book lift to the English rooms above is located in the work area.

Special Student Areas. The student center is located in an appropriate room near the social hall. This area is primarily for students' use in developing concepts and practices of democratic living. There are rest rooms for the students in this area. This total area may be segregated from the rest of the building. Special features are draw drapes on glass partition walls, and blackout curtains for visual instruction.

Adjacent to this room is a student store which has a show window with display

shelves and an attractive modern sales counter.

The paved court area between the wings has benches and areas which may be used for outdoor classrooms, "milling," stage, games, and social activities. This attractive area is basic to the total educational program of this school.

Administrative Suite. These areas contain facilities for the principal's office, conference room, and secretary's room; the general office with a circular counter; office for the assistant principal, intercommunication room, mimeograph room, financial secretary's room, mail center, vault, toilets, storage for files; the guidance center with student records and four offices and a testing room.

Health Suite. This area has facilities for a nurse, boys' and girls' examination rooms, toilets for each sex, and separate cot rooms for the boys and girls who become incapacitated at school.

Teachers' Areas. Facilities for teacher committees to meet and work are placed in this area. Separate rest rooms and storage for wraps are provided. This area also has a small kitchenette for teacher use.

Lounge areas for both sexes are on each floor and a teachers' dining room is located adjacent to the cafeteria kitchen.

Student-Adult Social Areas

Social Hall and Lounge. This area is planned to care for 500 students or adults. The outer lounge area is a small meeting place for committees. The student council equipped it with drapes, modern furniture, and a television set. The large social area is equipped with folding tables and chairs. Special features include sliding glass walls between the social areas and the adjacent terraces. These covered terraces provide outside areas for dining and social functions. A stage is strategically located in the main social hall. The cold lunch counter has a serving window to the adjoining terrace.

A well-planned food service and kitchen areas, containing three hot-food and one cold-food counters, are completely separated from the social area by an appropriate partition to isolate sound, smell, and sight.

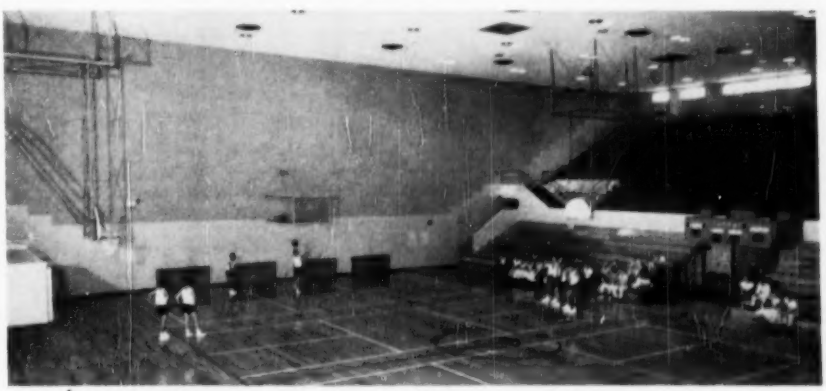
Physical Education Units. These two areas are for both boys and girls. The boys' gymnasium seats 3300 spectators and is to be used by the community for competitive sports as well as the local physical education program. It is acoustically treated and well ventilated.

The girls' gymnasium is planned for physical education and corrective exercises. It has a corrective room and sunroom for health instruction.

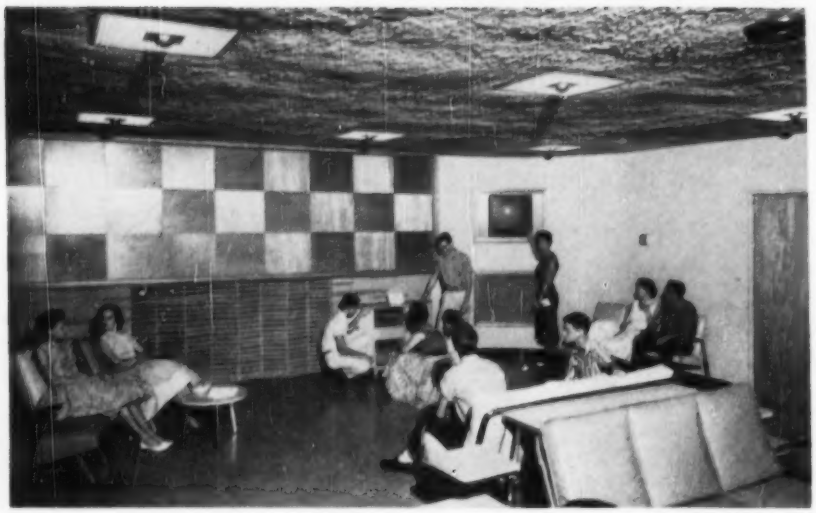
Auditorium and Little Theater. This windowless area seats 1554 on one floor. An attractive lobby contains coat check rooms, easy access to public telephones, powder rooms, and toilets.

The industrial-arts department of Northwest Classen includes areas for mechanical drawing, woodwork (shown above), and the combined auto mechanics, sheet metal, and machine shop.

The auditorium seats 1554 persons, has a mahogany veneer wainscot, and blown-on asbestos acoustical plaster above. Its complement, the little theater, seats 150.



The boys' gymnasium has seating accommodations for 3300 spectators; the girls' gymnasium is planned for physical education and corrective exercises.



Extensive space and facilities were set aside in Classen to provide for the social development of its student body. One of the rooms, the social hall adjacent to the cafeteria, is shown at the left. Below is a view of the teachers' cafeteria.

The Little Theater, which seats 150, may be used by the community as well as the student body. This attractive space has provision for radio broadcasting from the stage or audience and is prepared for a future TV studio.

General Corridors. The floors are terrazzo. The wainscot, 6 feet 6 inches high, of ceramic glazed structural tile with about 2 feet 6 inches plaster above. Glass walls are prominent in the administrative, student center, and library areas.

The Costs

The costs of the plant to date by items are:

1. Standard track to be used by all schools	$ 66,754.18
2. Athletic dressing rooms and baseball field and bleachers, all schools	193,145.96
3. Site improvements, sidewalks, paved parking, drains, etc.	158,439.97
4. Grading and drainage on site	16,282.47
5. Building contracts	3,792,478.84
6. Equipment to date	233,573.93
Total	$4,460,675.35

The federal impact program paid $1,489,344 toward the construction of the building. The construction costs were slightly less than $11.77 per square foot.

The science curriculum of Classen provides for instruction in biology, geology, physics, and chemistry. A greenhouse is also provided. The special, raised-platform, science lecture room is shown above.

SANITY IN SCHOOL BUILDING

FRANK C. GILSON

Supervising Architect, Division of School Buildings and Grounds
New York State Education Department

In the January, 1956, Journal, an article by Dr. Gilson questioned current practices in school planning that tended toward cleverness at the expense of soundness — with emphasis on the unusual rather than the proved good. Reader response — favorable on the whole, sharply critical in isolated instances — seemed to demand a positive expansion of Dr. Gilson's thought which would pinpoint some answers to sanity in schoolbuilding planning. Perhaps this guidance toward worthy school plant design is especially appropriate nowadays when more and more board members and their administrators are complaining of the architect who "tries to put in innovations which will win professional acclaim for him but which may not serve the board's purposes" and serve to increase school costs unnecessarily.

A presentation of sane school design is a difficult assignment — too much to cover adequately in one article. The following, however, is my effort to pinpoint some answers to sanity in schoolbuilding planning. It does not pretend to quote from experts nor to involve extended research. It rather is based upon observations of trends, of fashions, and of needs as indicated through 30 years of school planning, largely in New York State and New England.

Sanity in school building would seem to mean planning a conservative building. That alone is not enough. It should not be out-of-date when built nor extreme in its design, arrangements, or space provisions. A "sane" building should be a good building which will stay good for a long time.

A good school building should house today's program and today's children with safety and comfort — it should provide the space and tools for teaching and learning. In addition, it should, in so far as possible, be able to house future programs with minimum changes at minimum expense for changes and upkeep in the meantime.

To evaluate future needs we have to rely on past experience, to examine trends, and to build with the realization that changes may be slow but certain.

Most new school buildings will still be in use 50 years or more. With that in mind, they should be built to last that long without collapse or continuous disintegration.

Innovations in Material and Design

What about new ideas in materials or design? It hardly seems wise to experiment with a complete building. New classroom lighting with plastic ceiling should, for example, be studied and developed but not, in my opinion, with an entire school. One classroom or one laboratory would provide enough research at one time and in one building. Similarly, a plastic "skin" could be tried for gymnasium exterior wall surface and lighting. If proved successful, it could be developed and adopted for more general use.

The campus school might be a successful solution for a rough and difficult site, but not so desirable with units widely separated in open country. The "school within a school" idea, although not new, may be approached for study without fixing the program for a three or four million dollar high school. There are usually more accepted and proved good ideas in school planning than most districts can buy. It does seem foolish, therefore, to utilize untried ideas at the expense of those sound ones which probably will do a better job.

Comparative Material Standards

In terms of materials, it is at present easier to select those which have stood the test of time. For example, it is possible to list the good and the not so good. Comparative standards could be added for many general construction materials, for heating and ventilation, electrical, and plumbing trades. Each architect would naturally make up a different list but many of the items would be included in any listing.

In planning for the future, our least difficult problem can be in site selection and development. Except in certain areas, near cities or on Long Island, for example, site purchase cost is usually the biggest bargain in the building budget. It is quite logical and foresighted to buy one hundred or more acres, realizing that it may be years before more than one third will be used. The building and surroundings should be located so as not to dissipate available land nor to prevent future addition or future buildings. Sites should be purchased long before needed — it is cheaper that way. With reasonable study and foresight, they could be better located for their service area.

Publicity for "the Odd, the Bizarre"

Questions relating to the fanfare of some magazines for the unusual in school design — while schools of reasonable modern design are often ignored — deserve answers.

Probably much of the fault is not with the magazines. Perhaps architects who wish publicity have designed to bait the publishers and the public with novelty, with striking photographs of unusual features. It may be that those same architects write or help write the articles while the editors are not staffed to choose a better cross section of what is being done and accepted and in general wanted.

However, in the planning of school buildings we should not be content with

A LISTING OF COMPARATIVE MATERIAL STANDARDS

Item	*Good*	*Not So Good*
Exterior Walls	Masonry With Membrane Waterproofing and Vit. Tile Backup	Masonry With Dampproofing
First Floor Construction	Slab With Crawl Space Throughout	Slab on Ground
Flashing	Lead Coated Copper and Copper	Membrane or Galvanized Iron
Roof Insulation	Fiberglas or Mineral Fiber	Wood Fiberboard
Exterior Doors	Aluminum or Metal Clad	Wood
Corridor Floors	Terrazzo or Tile	Asphalt Tile or Concrete
Corridor Wainscot	Tile or Glazed Block	Plaster or Painted Block
Classroom Floors	Vinyl or Linoleum	Asphalt Tile
Windows	Aluminum	Steel or Wood
Interior Doors	Heavy Solid Core Sawed Veneer	Thin Veneer Commercial Grade
Ceilings	Acoustical Tile	Acoustical Plaster
Stairs	Steel With Terrazzo or Bluestone Treads	Steel and Concrete
Hardware	Solid Brass or Bronze	Cheap Lightweight Stamped

past success alone. Certainly the campus school encouraged a trend toward the more open plan — the use of semi-detached additions — all to the good. The thought back of the "school within a school" should be commended. It makes more of us realize that a building should be a school rather than an institution.

It has been encouraging in recent years to mark the changes in exterior design of school buildings. Simple building masses expressing interior function have taken over from traditional period exterior which usually sought to disguise the purposes and workings of the school within. However, this new freedom has encouraged some excesses in meaningless shapes and color treatments, unused shelters and terraces, hot and cold glaring glass walls, unkempt courts and growing areas.

In the matter of beauty, we would do well like some European countries to budget an amount, 2 or 3 per cent for example, for art, artistic embellishment whether it be in paintings, sculpture, inscriptions, or decorative treatments to relieve the plainness of modern architecture. These treatments could tell a story, instruct and inspire, or simply cheer and brighten otherwise drab surfaces. Some of our schools have lost the warmth and homeliness of former years.

Hints for "Sane" Schools

To build a school sanely today one should:

1. Secure and develop a good site large enough for all possible future needs.

2. Secure an architect who regards your school building as an individual project; who understands your local problems and needs, who is sympathetic to the kind of school building you want, custom-tailored to your community and to your educational program.

3. Plan a building for additions and expansible within by adding suitable space to the special rooms — cafeteria and homemaking, for example.

4. With your architect, try to be sure your building will remain in good taste, if not in current style, that it will grow old gracefully, and that it will mature in pride without apology for design or finish.

5. Plan some high school spaces with office-type movable partitions.

6. Install the most durable wall, floor, and ceiling materials the budget can afford, the best windows and doors, and the most durable hardware and trim.

7. Avoid extensive use of untried and novel materials and finishes.

8. Avoid radical planning for experimental programs which fix an inflexible educational pattern.

9. Avoid freakish architectural design which is faddish and dated.

10. Learn as much as possible from past experience as to what trends and what developments are likely to be the most commonly accepted practice.

To help us do this our school magazines should lead us toward that goal — be in front but headed generally in the right direction — avoiding the temporary tangents in an effort to be different and spectacular. Let their guidance and efforts be toward the improvement in quality, rather than variety of form with a premium on the unusual.

1. Why do magazines, school and architectural, feel bound to publish articles about only the new, the freakish, the odd, the bizarre, and unusual school buildings?

2. Are not good schools of reasonable modern design, well zoned for use, constructed of durable and appropriate materials, newsworthy?

3. Why is it that in spite of all the publicity given to unique schools, most school building contracts are given to architects whose work is clean-cut, well proportioned, and durable? Why then are these not published and awarded if they are so generally acceptable?

Pupil dispersal in school organization, prefabricated assemblies, community participation: these are the current—

TRENDS IN SCHOOL DESIGN

DON L. ESSEX

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New York State Education Department

An individual who is in a position to influence school building planning can be guilty of confusing his own objectives with trends. I have, however, tried to be objective in this article. The trends listed below are the result of our experience and of our observations, supplemented by information secured from periodicals and from letters and conversations with school building specialists.

In the main, school building planning is a generation behind the most advanced thinking of educational leaders. Some of us get impatient with this situation and would like to move faster. But, some lag is desirable in order to give our school people a chance to sift the wheat from the chaff, to permit fads to run their course, and, if new programs finally are to be adopted, to allow time to train teachers.

One of the trends is concerned with the efforts to disperse the pupils in a high school building in an orderly and purposeful manner. Our boards are looking for ways to get away from assembly-line mass education. They want to combine the advantage of the individual attention a student gets in the small high school with the advantage of the broad educational program that can be offered in the big high school. Hence, the widespread interest in the "school-within-a-school" and the campus school. Certainly the objective of both types of organization is excellent.

"School-Within-a-School"

For many years we have attempted to get separation of most of the activities of the junior high school and of the senior high school. Only the large facilities such as the gymnasium, auditorium, and cafeteria, and certain facilities of the pupil personnel suite are used in common. Inside these groups we commonly cling to the division by subject matter.

The "school-within-a-school" or "little school" carries the division still farther. If the school is large enough, a "school-within-a-school" would be set up for each grade. Or it might be a group of, say, 250 pupils cutting across the three grades of junior high. Because of the wide spread of subject matter at the senior high school level, it is more difficult to organize this unit in this manner.

The Campus School

There are many variations of the campus school. Entirely separate units, units connected by covered walks, and units connected by corridors are the three most common types. The objective in general is the same as in the "school-within-a-school" — the dispersal of pupils into smaller groups. Grouping can be either by subject matter or by grades. Grouping by subject matter has the disadvantage that the teachers in a given subject matter area tend to work together to the exclusion of other teachers. Co-ordination and integration may be seriously curtailed.

School Sites

Acreage requirements for school sites are increasing. This is due in part to various state regulations, but more significant is the expanded school curriculum and the increasing demands by the community for its use.

The school program is expanding upward through the junior college and downward through the kindergarten. So-called extracurricular activities are now a recognized part of the prescribed program.

Tremendous growth in school population has removed the guesswork from many school officials' minds as to whether a building should be planned for a future addition or new site to be acquired for a new building. Boards of education are now profiting from past experiences of earlier boards who lacked experience and, in some cases, foresight in selecting sites for expansion of both building and curriculum.

School boards composed primarily of sound businessmen are becoming increasingly conscious of the need for larger sites and are approaching site acquisition in a manner such as they would approach any long-range business venture. They are insisting upon larger sites to take care of future needs and are acting now before costs rise even higher than the present costly land.

The use of the school plant at night by adults for continuing education and recreation, a greater interest on the part of the public in general for spectator sports, the change in the desires of people to drive to the school for its many cultural and recreational facilities have all caused a strain on the parking facilities that schools of yesteryear did not have to provide.

Today most faculty members drive to school, some high school students drive and many of those who do not are transported by bus. Where to park? Expansion of the present site or acquiring larger new sites to permit off-street parking has become a necessity for safety as well as convenience. With hundreds of people coming to school for many and various reasons, the site must be chosen that will accommodate the present demands made upon it as well as for the expected increase in the future.

Secondary Classrooms

The current trend in secondary educational facilities is clearly in the direction of more complete facilities for all subjects. This movement is generally toward a type of laboratory space which

The purpose of the campus school "in general is the same as the 'school-within-a-school' — the dispersal of pupils into smaller groups." One of the variations of the campus school is shown in this perspective of the Fredericktown, Ohio, elementary school designed by Joseph Baker and Associates, architects, Newark, Ohio.

lends itself to all skills and forms of expression in any learning situation. These laboratories provide a greater opportunity for program flexibility as well as for a variety of equipment and apparatus.

The modern concept of the secondary classroom is not that of a lecture room but rather a place where a variety of constructive and manipulative operations are carried on using the problem-solving technique. Individual needs of pupils are met by means of a variety of learning situations. These may occur several times during a school day and, in some cases, during a single class period. Students will debate, hold elections, dramatize, prepare programs, study, view films, work on committees, make speeches, and participate in a multitude of other activities. Some of these activities will involve an entire class group, others only a committee or, in some cases, individuals.

Classroom equipment in the modern school is noticeably different than that of 30 years ago. Fixed furniture is a thing of the past. Practically all schools now buy movable classroom furniture which lends itself more adequately to the variety in the modern program. Classrooms also now house such items as tape recorders, projectors, library and reference books, vertical files, newspaper racks, and so forth.

All of these items require additional space not only for their use but also for storage. Movable furniture demands more space than the fixed type.

Improvements in lighting techniques have made possible variations in classroom widths. These variations, mostly in the direction of wider classrooms, have provided a more flexible and more practical instructional area by departing from the narrow rectangular classroom of old. There is also a tendency to eliminate the traditional classroom arrangement, e.g., the front wall is not necessarily the wall the children face. Some teachers are so unaware of the problem of glare that they even allow pupils to face window walls and are undisturbed by the resultant squinting and blinking of eyes. Much greater use is made of the wall surfaces for display purposes. Teachers are asking for a higher proportion of tack-board space and, in many cases, are willing to sacrifice some chalkboard area to get it.

Preformed Assemblies

As with other types of large-scale construction, school building techniques are feeling the impact of the materials' manufacturing evolution in building products. This evolution has come about through modern competitive business enterprise, improved manufacturing processes, and the designer's skill.

The change in building products is recently most evident in the large number of preformed parts and some assemblies (prefabricated parts) which come to the job ready for installation and erection. This trend has not limited school design. There is more variety in plan and elevation in the new schools than at any time in recent years. Nor has it necessarily limited the quality of workmanship or the durability of school buildings.

It has long past ceased to be a novelty to see these new types of structural components incorporated in school building projects. Laymen, school administrators, and school board members feel quite free to use the terms "bar joist," "window and wall panels," "roof and floor units," "movable partition," etc.

Until recently the architect had to "sell" a district this type of construction. Now boards are asking architect not only to use preassembled parts but to leave many of these assemblies exposed both for economy and because they feel that there is an attractive and honest expression in their exposure in the finished work.

An important consideration in schoolhouse construction is the time lag between authorization to build and acceptance of the finished building. A great majority of districts find that it takes physical overcrowding and inconvenience in the existing school plant before a building project can be voted. This means that the need for new facilities is already acute and speed of construction is of particular importance. With the shortage of skilled construction labor available to work on school projects, it begins to be more and more desirable to have as much of the material "preassembled" as possible before delivery, thereby reducing erection time, labor problems, and possibly materials' cost. It is usually more efficient to assemble materials at the factory under more ideal control of conditions of manufacture of structural components than on the job where variations in climate, environment, labor, etc., can contribute to costly delays in time of construction and methods of assembly.

Some of the latest systems of preformed parts are the basis for complete buildings. These systems sometimes include patented techniques. Almost all of them have been successfully adapted to meet district school housing problems with the architectural plan varying to meet individual need.

The future seems to point to more of this type of factory preassembled construction if time schedules and budget requirements are to be met. With imaginative and competent architects and school administrators, there is no reason to predict a monotony of uniformity. We should rather expect individual expression to dominate the design with a building unity achieved through similarity of technique and building methods.

Air Conditioning

With the widespread installations of air-conditioning equipment in private buildings and in state and federal buildings, it was inevitable that they should make their appearance in school buildings. So far, they have been limited mainly to auditoriums and administrative suites. However, a school in Texas has been reported as being entirely air conditioned.

Swimming Pools

Over the past few years swimming pools have become increasingly popular in school plants, especially high schools. These facilities are also extensively used out of school hours through community

Trends toward the increased use of glass and the increased school site size are illustrated in these views of the Clara E. Coleman school, Glen Rock, New Jersey.

programs. Although a pool is a costly physical education station to build and maintain, the expense is usually felt to be easily justified in safety and educational values received.

Increased Administration Space

For the purpose of our discussion we will consider the administration space of a school to consist of the area devoted to general administration of the school, the health suite, and the area devoted to guidance and pupil personnel services.

Today's schools generally are larger units. Former school districts have been combined to form new districts with a larger pupil population. These districts in turn have often constructed larger physical plants. Both of these developments have made it necessary to provide increased administration space.

Today's schools provide more services for pupils. Reading and speech specialists, psychologists, psychiatrists, dental hygienists, curriculum specialists, and supervisors are some of the services which are now provided but which were very seldom available in the past. These specialists, of course, must be provided with some base of operations.

Schools are much wider in the scope of their activities today than they were yesteryear. For example, food service in the United States today is a billion dollar business. Great impetus was given to this program by the School Lunch Act of 1946. School transportation on a nationwide basis involves more than $300,000,000 annually. About two thirds of the school districts own their own buses, and the trend is more and more toward district ownership. Compare only these two items with what existed 20 years ago and we can see quite easily that such programs cannot be added to the school activities without adding personnel to administer the program. Added personnel means additional space for the professional staff members and clerical help.

Community Activities

With our culture becoming more complex, with changes in technological processes, with more free time, a need is more desperately felt by more adults to become more proficient in the "art of living." As a result, adult education has increased phenomenally in recent years.

In 1924 there were one million people involved; in 1934 there were one and a half million; and by 1955 the number had climbed to three and one-half million. In 1955 in New York alone more people enrolled in adult education classes (713,785) than were enrolled in grades 9–12 of the high school (543,412).

This type of education varies according to the participants. In many instances it is a method of learning a new skill. It may involve higher proficiency in an already acquired one. It may satisfy the desire to become better acquainted with everyday problems on the local, national, or international scene or it may provide an opportunity to socialize with one's neighbors.

Aside from the educational phase, schools are used for other community activities. They are used as meeting places for a wide variety of organizations. Just to name a few — scouts, FFA, FHA, 4H, Community Chest, PTA, and youth groups.

Often the school with its auditorium is the one large place in the community where community dinners, musical and minstrel plays, etc., can be held.

Recreational organizations more and more are and should be using the facilities of the school. This applies to the school building as well as the grounds. Many summertime youth programs use various parts of the school building as well as the playgrounds. Gymnasiums, swimming pools, rifle ranges, and bowling alleys are areas that are sometimes provided in schools and which are used by the community when available.

The above are examples of ways in which communities are using school buildings. The actual use will vary from community to community, dependent upon the relationship between the school board and community and the degree to which the administration of the school sees its duty to provide a greater opportunity to all members of the community.

In order to accommodate this greatly increased use of the school building for adult and community activities, schools have found it necessary to provide office and clerical space for administrative personnel, storage space at appropriate places to accommodate materials on which the adult groups are working, and space to accommodate wraps or coat racks.

The fact that much of the community activity takes place after regular school hours and in the evening has made it necessary to be sure that adequate artificial lighting for the various activities is provided. It is also paramount in planning a building to consider the areas that might most often be used by community groups. These areas are often limited to one section of the building, thus eliminating the necessity for providing heat for the entire plant when only part of it is used.

People in a community who use the school building are of all ages; thus buildings of one level are often given greater consideration.

The Use of Glass

Since World War II the use of glass in schools has increased — in window walls, in clerestory lighting, in skylighting, in glass-block walls and windows, in transoms and corridor lighting. Masonry window piers went out and window walls came in. The outside was "brought in" and the inside looked out.

Largely because of the difficulty of light control and the consequent danger of glare, our school building specialists are now questioning this extensive use of glass. Perhaps the danger from bombs, as stressed by our Civil Defense people, has something to do with this attitude.

The use of glass block for classroom lighting is declining in many areas; the use of low light transmission glass is increasing.

Plastic bubble skylighting is increasing, particularly in the cooler regions. The diffusing should remove many earlier complaints.

Color of Chalk Boards

The trend away from blackboards continues. We have used blackboards primarily because slate is black. Furthermore, it is durable. Low lighting levels of former years required a sharp contrast between the chalk and its background. With greatly improved daylighting and artificial lighting techniques, this contrast is no longer necessary.

Community Participation

There is a trend which probably does not show up in school building design, but is one of the most wholesome and heart warming of all trends. That is community participation in the planning of school buildings. It is no longer uncommon for the board to appoint a citizens' committee to assist in the determination of enrollment trends, to advise on the program to be housed, to study the financial implications of the building program, and to propose means and ways to gain support for the bond issue.

Board members no longer feel that the school building is something sacred to themselves alone, but that it is part and parcel of the community, and the community should have a hand in its planning. It is a slow process, the architect cannot move as fast as he would like, but the results are a building planned to house the program desired by the comunity, support for the bond issue, and much greater community interest in the school, which, if nurtured, carries on indefinitely after the building is erected.

Experimentation

We are in a great period of experimentation. Some of it may prove to be good, some of it bad. But as I see hundreds of plans, mostly, of course, from New York State, but some from almost every state in the country, I am convinced that most of it is good and that we are getting today school buildings that are warm, bright, pleasant, less institutional, functional, and, all in all, good places to go to school.

Let us encourage this experimentation. It is only through experimentation that improvement is made, that progress is attained. Perfection will never be reached, but there must be a never ending search for it. But let us not mistake change for the sake of change, something different for the sake of difference, for progress. **END**

Assisting Mr. Essex in the preparation of this article were the following members of the New York School Buildings and Grounds staff: Frank C. Gilson, W. Tjark Reiss, Louis W. Armstrong, Basil L. Hick, and Richmond C. Young.

HIGH SCHOOL SIZE AND BUILDING COSTS

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On the face of it, it would seem logical that the cost per pupil of constructing a high school would be less for a larger school than for a smaller one. A small school must allow "minimum" spaces for such purposes as the auditorium, the gymnasium, and the principal's office which are in the "overhead" category. The principal, for example, must have, let us say, at least 200 square feet for his office whether he is in a high school of 100 or a high school of 500 pupils. The minimum spaces thus mount up in the small school, reflecting high proportions of the total space budget. Moreover, the small school has difficulties in utilization of its spaces. Small schools must have small classes; for instance, in third-year mathematics or third-year modern language, and there are not enough sections of special subjects and activities such as science, shop, and music to fully utilize these spaces most every period of the day.

The main common denominator of cost (other than variations due to type of construction and design) is the space allocation. Hence, to the extent that the above observations are defensible, to that extent does a larger school cost less per pupil. Experience shows that this is significantly true up to a certain point. As a matter of fact, the actual space budgets per pupil in schools constructed in the United States are increasingly less as the size of school increases.

What Is Genuine Economy?

The experience of assessing the adequacy of spaces in many schools suggests, however, that a good part of the savings in space costs per pupil in large high schools is not genuine economy. What often happens is that the larger schools are made larger by adding more standard classrooms without adequately providing comparable auxiliary spaces. For instance, the ratio of administrative space to students is usually too low in large schools. If it is desirable, for instance, to have one administrative or supervisory person in a school of 500 students, it is reasonable to expect that three would be needed in a school of 1500. The office space required for one person to function effectively in an administrative or supervisory post would be required for another. Also one would expect that library spaces should be roughly in proportion to the student body. As a matter of fact, in large schools it might be necessary to provide even more library space by having more than a single library room in order to make such facilities accessible to children and to help compensate for the barriers to convenient learning situations which are encountered in the very large school largely because of the wide separation of spaces in larger schools.

The same might be said for guidance and other special personnel. As a school becomes increasingly large, the machinery for observing, recording, interpreting, and acting upon information concerning the progress of individual pupils becomes more difficult. One could easily defend a larger number of administrative, guidance, and supervisory persons per 100 pupils, for example, in the larger school than in the smaller school. In other words, there is reason to expect that part of the apparent savings in the cost of construction of large high schools is false economy.

A Theoretical Space Budget

In an effort to check upon this, theoretical space budgets were developed for high schools on an identical set of standards for space adequacy. These standards are to some extent arbitrary since there really is no clear standard of space requirements for high schools. The regulations in the several states differ on the subject and many of the problems of arranging spaces for schools in which innovations have been intro-

duced in instructional programs have not been solved. Obviously, a school should be designed as far as possible in terms of the particular characteristics

Table 1

AVERAGE DAILY PUPIL-PERIODS OF INSTRUCTION REQUIRED IN HIGH SCHOOLS OF THREE DIFFERENT SIZES ON ASSUMED COMPARABLE COURSE DISTRIBUTION

	Size of School		
Subject Matter Field	400	1,500	1,800
Total	2,400	9,000	10,800
Interchangeable*	1,180	4,425	5,310
Science	240	900	1,080
Business education	200	750	900
Homemaking	100	375	450
Industrial arts	100	375	450
Physical education	400	1,500	1,800
Music	120	450	540
Arts and crafts	60	225	270

*English, mathematics, social studies, language

of the educational program expected within it. However, the most commonly advocated criteria were used in the present analysis for purposes of comparability.

A uniform program of studies was assumed so that the expected distribution of students in a class schedule for the three schools is assumed to be proportional. The utilization of spaces in a high school depends upon the kind of schedule, the proportions of students taking various courses, the number of periods in a day, and so on. Six periods daily were assumed. The number of daily pupil-periods of instruction in various subject matter areas on this basis is shown in Table 1 for three schools of 400, 1500, and 1800 student capacity respectively. There has been

Table 2

AVERAGE DAILY NUMBER OF CLASS SESSIONS REQUIRED ON ASSUMED COURSE DISTRIBTUION OF TABLE 1 AND CLASS SIZE AVERAGE AS SHOWN

	Average	Size of School		
Subject matter field	Class Size	400	1,500	1,800
Interchangeable	25	47	177	213
Science	20	12	45	54
Business education	25	8	30	36
Homemaking	20	5	19	23
Industrial arts	20	5	19	23
Physical education	35	12	43	51
Music	50	2	9	11
Arts and crafts	20	3	11	14

an increasing trend toward tailor-making spaces for all subject matter areas, but the fields of English, mathematics, social studies, and language are assumed to be in more or less "interchangeable" classrooms.

An average class size as shown in the first column of figures of Table 2 for each of these subject matter fields was the basis of computations. By dividing this average class size into the average daily pupil-periods shown in Table 1, we arrive at the total number of daily class sessions in each subject matter field as shown in Table 2.

It is not possible in a departmentalized high school because of scheduling problems to utilize every classroom every period. Therefore, the average number of daily class sessions was divided by six, then an allowance was made for utilization in order to determine the number of rooms needed. We assume an 80 per cent utilization in the school of 400 and an 85 per cent utilization in schools of 1500 and 1800. For instance, in the school of 400 we estimate 47 daily class sessions in interchangeable classrooms. Dividing by the six periods daily this means about eight classrooms at 100 per cent utilization, but at 80 per cent utilization, 10 classrooms will be required. Roughly speaking, in a six-period day in this school, a classroom will be expected to handle about 120 pupil-periods instead of 25 times 6 or 150.

Teaching Stations

Similarly, we compute the minimum number of teacher stations needed for

Table 3

TEACHING STATIONS NEEDED TO PROVIDE CLASS SESSIONS IN TABLE 2*

	Size of School		
Type of Teaching Station	400	1,500	1,800
Interchangeable	10	35	42
Science	3	9	11
Business education	2	6	7
Homemaking	1	4	5
Industrial arts	1	4	5
Physical education	3	9	10
Music	1	2	2
Arts and crafts	1	2	3

*Assume scheduling will allow 80 per cent utilization in school of 400 and 85 per cent utilization in schools of 1,500 and 1,800.

the other types of instructional spaces for the school of 400 as shown in Table 3, and by assuming 85 per cent utilization, the various spaces for the other two schools. These are classroom spaces only. They do not include the library, the cafeteria, the auditorium, administrative spaces, various student service spaces, and other areas such as corridors, closets, toilets, custodial spaces, etc. With the data of Table 3 certain standards were applied to each of the schools and a space budget in square feet of floor area was prepared as shown in Table 4.

The interchangeable classrooms were computed at an average of 800 square feet each. Science rooms were computed at 1200 square feet each. A variation was allowed in business education because some subjects such as secretarial practice do not require rooms as large as those in which there are machines

Table 4

SPACE BUDGETS FOR THREE HIGH SCHOOLS OF DIFFERENT SIZE ON COMPARABLE STANDARDS OF SPACE ALLOCATION, IN SQUARE FEET OF FLOOR AREA

	Size of School		
Type of Space	400	1,500	1,800
General classrooms	8,000	28,000	33,600
Science rooms	3,600	10,800	13,200
Business education rooms	1,800	5,400	6,400
Homemaking	1,300	5,200	6,500
Shops	2,000	9,000	11,500
Indoor physical education	13,000	34,600	35,900
Music	1,500	5,940	5,940
Arts and crafts	1,000	2,000	3,000
Library	2,100	5,985	7,000
Cafeteria	3,000	7,680	9,500
Auditorium	4,400	9,200	10,700
Administration	1,630	3,730	4,470
Health unit	550	1,280	1,450
Student activities	300	900	1,200
Total educational	44,080	129,715	150,360
Other	14,700	43,285	50,140
Gross area	58,780	173,000	200,500
Gross area per student	147	115	111

and equipment used in office practice training. Some rooms were computed at 800 square feet and others at 1000. Homemaking rooms were computed at 1300 square feet each.

A general shop was assumed in the small school — the one of 400 enrollment capacity — at a total of 2000 square feet. In the larger schools, it was assumed that a vocational trade and industrial program would be introduced requiring approximately one half of the shops at a larger space allocation of 2500 square feet each.

In the physical education program, a double gymnasium of approximately 7300 square feet was assumed in the small school, and two double gymnasiums of 8400 square feet each were assumed in both of the larger schools. Additional indoor physical education teaching stations were calculated at an average of 2000 square feet each in the two large schools and 2400 square

HIGH SCHOOL SIZE AND BUILDING COSTS . . .

If comparable standards are applied in the allocating of spaces in schools of different size there is not much gain in space after a school has reached about 1500 in size . . .

feet in the smallest school. Shower and locker room space for boys and girls was computed at a rate of 20 square feet per pupil in the largest class expected. Allowances were made in addition for office space in the physical education suite.

Large choral and instrumental music rooms were allowed in the two large schools of a size in proportion to the expected number of students who would be involved in band, orchestra, and choral work. A single multi-purpose choral and rehearsal room of 1300 square feet plus practice rooms and storage was allowed in the small school.

Library space was computed at a rate of seating capacity for 15 per cent of the student body up to 500 plus 10 per cent of the student body exceeding 500, if any. The areas for library seating space were computed at 30 square feet per pupil. Additional space for storage, workroom, and conference rooms was computed at 14 per cent of the seating space.

Other Auxiliary Areas

It was assumed that in each school, 80 per cent of the students would eat their lunch in school. Two shifts of 160 each were assumed for the school of 400 enrollment and three shifts of 400 and of 500 each in the two schools of 1500 and 1800 capacity respectively. Service areas were computed in proportion to the size of the shift and kitchen office and food storage spaces were computed in proportion to the number of meals to be served.

Auditoriums were included for each of the three schools. A seating capacity of 400 was allowed for the smallest school and seating capacities of 800 and 1000 were allowed respectively for the two large schools. It was expected that classrooms would be used for dressing rooms in the small school, but two dressing rooms were allowed in each of the two larger schools. Appropriate spaces for the stage were taken into account in the computations.

The administration space, the public waiting room, and general office were taken to vary from 330 to 880 to 990 square feet in the three schools. Two hundred square feet were allowed in each case for the principal. In addition, an assistant principal, guidance director, or other nonteaching staff member was allowed at the rate of one for each 500 pupils and computations were based on 150 square feet of space for each person. Allowance for storage, conference, and other spaces in administration were made according to common standards, and teacher workrooms and rest rooms were allowed roughly in proportion to student enrollment expected.

A student activities room of 300 square feet was allowed for each 500 students. The minimum acceptable standards for a health unit were applied to the three schools.

All these spaces were taken to account for 75 per cent of the total space in the building so that the gross area was determined on this basis. The result of these computations in Table 4 shows 147 square feet per student for the school of 400, a total of 115 square feet per student for the school of 1500, and 111 square feet per student in the school of 1800.

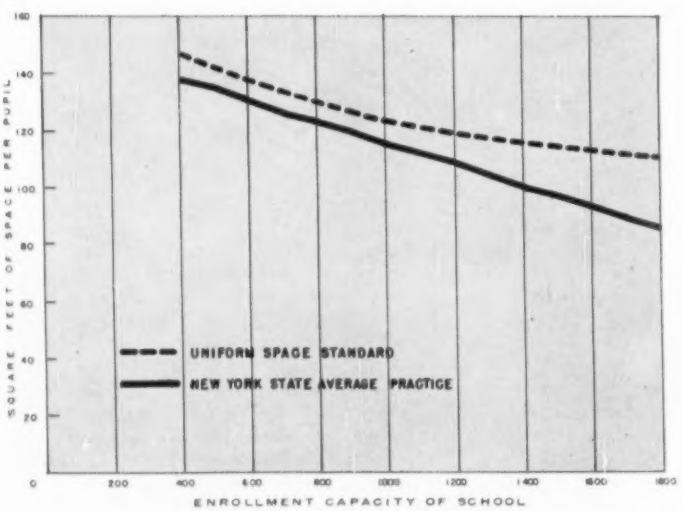
Conclusions

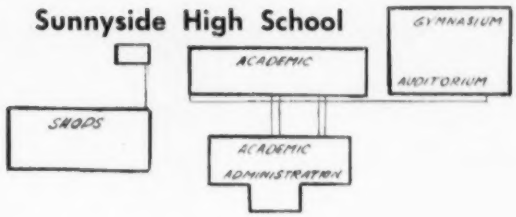
The point of these computations is not to recommend some particular kind of space allocation for schools. It is simply to show that if comparable standards are applied in the allocating of spaces in schools of different size there is not much gain in space after a school has reached about 1500 in size. There is a possible four per cent advantage in the school of 1800 over the school of 1500.

Adequate standards generally exceed average practice. For so many years, school systems have planned buildings on austerity budgets that many structures provide spaces far below acceptable standards. There are very few large high schools, for instance, in which physical education is provided so that each student may have five periods of physical education a week.

The solid line in the accompanying chart shows the actual average in space per pupil reported recently for the state of New York. A line which would use the kind of standards included in Table 4 for schools of various size would be the dotted line shown in the chart. Notice that the two lines begin to diverge after about 1200 or 1300 enrollment. Note also that after about 1500 the dotted line based on uniformity of standards, tends to level off. There is less and less advantage in inincreasing the size of the school as the anticipated capacity is larger.

RELATIONSHIP BETWEEN SPACE PER PUPIL AND SIZE OF HIGH SCHOOL





A Secondary Plant in the Campus Mode

Construction of Building

WALTER H. ROTHE

Architect, Yakima, Wash.

There are two basic reasons for choosing the campus style when the Sunnyside, Wash., senior high school was planned. First, the architect wanted a plan whereby congestion of traffic would be at a minimum in order to avoid confusion and noise. Second, it was estimated that several buildings would not cost any more than a single building, considering the cost of fire walls. (To meet local building codes fire walls would have been necessary; even so, insurance rates would have been higher than is the case with segregated buildings.)

It was also decided that effective arrangement of space could be better accomplished in multiple buildings. Awkward space quite often develops in a single large building. To avoid this unsuitable space, a single building often results in a sprawling plan which can prove to be costly in construction.

Components of the School

Sunnyside high school has 23 teaching stations and auxiliary areas divided into four buildings on a site of 67 acres. The first building contains the administrative areas, classrooms for the commercial phase of the academic program, and the band and choral rooms of the music department. The second building houses the industrial-arts department which includes farm, metal, general, and agriculture shops.

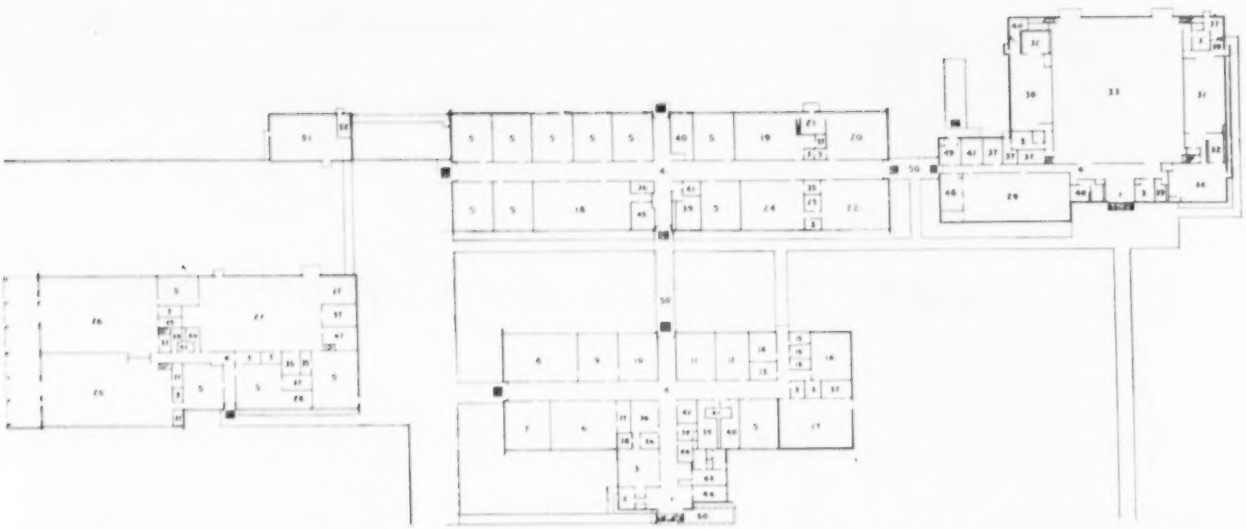
The third building contains the science and homemaking departments, as well as general classrooms and the library; the fourth plant has the gymnasium-auditorium and a lunchroom for serving meals brought to the school from a central kitchen.

Construction Materials

The separate buildings, except the gymnasium, were constructed of concrete slab on grade for floors, solid brick for walls, open web-steel joists with wood decking for roof, and wood frame with plaster for partitions. The gymnasium is poured lightweight concrete walls, hard wood floor on steel frame, and a steel framed roof with wood deck. Lightweight concrete was used due to a soil bearing condition that required reasonably light loads. This is a feature that worked out reasonably in cost and with complete satisfaction structurally.

The interior of the building is generally finished in plaster walls and acoustical fiberboard ceilings. The entire building is insulated and is equipped

A front exterior view of the (from left to right) industrial-arts, administration and classroom, and auditorium-gymnasium buildings of the Sunnyside, Wash., high school — Walter H. Rothe, architect, Yakima, Wash. Dr. Kenneth P. Mallery is superintendent in Sunnyside.



1. Lobby
2. Principal's Office
3. General Office
4. Corridor
5. Classroom
6. Art Room
7. Bookkeeping
8. Typing
9. Business Machines
10. Shorthand
11. Mathematics
12. Publication
13. Radio
14. Music
15. Practice
16. Choral
17. Band & Orchestra
18. Library
19. Food Laboratory
20. Clothing Laboratory
21. Home Making
22. Physics & Chemistry
23. Photography
24. Science & Biology
25. Farm Shop
26. Metal Shop
27. General Shop
28. Agriculture Laboratory
29. Lunchroom
30. Girls' Dressing Room
31. Boys' Dressing Room
32. Shower
33. Auditorium-Gymnasium
34. Varsity Dressing Room
35. Supply
36. Work Room
37. Storage
38. Vault
39. Boys' Toilet
40. Girls' Toilet
41. Janitor
42. Book Store
43. Clinic
44. Student Council
45. Stack Room
46. Tools
47. Finishing Room
48. Serving Kitchen
49. Receiving
50. Covered Walk
51. Heating Plant
52. Transformer Vault

with mechanical ventilation. Gymnasium, shower rooms, and all toilets have ceramic tile floors and walls. Washable latex paint was used in pastel colors on walls. Woodwork was finished in the blonde effect. Floor covering is asphalt tile in light colors.

The total square foot area of the building is 105,545 square feet. Total cost, including architect's fees, was $1,210,557.07, a square foot cost of $11.46.

Two views of a typical classroom in Sunnyside high school: the window wall (above) and the corridor wall (left) with the bi-lateral natural lighting arrangement. The walls are plaster; the artificial lighting incandescent; the floors asphalt tile. There are 16 general classrooms provided in the plant.

The metal shop of Sunnyside. Together with a farm shop, a general shop, and an agriculture laboratory, it makes up the industrial-arts department in a separate building.

Operation of Building

KENNETH P. MALLERY

Superintendent, Sunnyside, Wash.

The second year of the operation of the Sunnyside "campus type" high school has just come to a close. The operation during the two-year period has been quite successful. Students, faculty, and administration are well satisfied with the air of freedom and the ease of plant control.

Probably the greatest recommendation for this type of plan comes through the fact that teachers are separated and classes situated over a large area. This factor has been instrumental in eliminating practically all of the petty grievances that ordinarily exist in a school where students and teachers are congregated in a smaller area. Too, we have found that school discipline has improved to a great degree. Even though students are not under direct supervision at all times, there is very little need for individual supervisory control. The students are spread quite thinly over a large area and do not congregate in large groups in central areas. This point alone eliminates difficulty since most discipline problems evolve from large group action.

Some members of the community felt that there might be some problem with students going from one building to another in that they leave warm buildings and travel across a covered walk to another building. However, the operation of the above has shown this not to be a problem. The short time that students are in the cold has not resulted in illness, and teachers feel that there is an opposite effect — students come to class more invigorated from their rapid movements outside.

Noise Control

All shops are arranged in one building. This has been a particularly pleasant item because the noises of the shops do not carry to the classroom and the movement of machinery and supplies can be made freely and without any disturbance. As many of the students are working on power machinery and equipment, it is easy to realize the importance of this unit being away from the classroom section.

On the other hand, the music section is part of Building One housing the administration and classroom sections. Soundproofing in this area has eliminated any disturbance so long as the outside doors are closed. Many times we have had an 80 piece band and 90 member choir operating in the music area and have received no complaints from the classes that have been meeting just next door.

Seating 2750 persons, Sunnyside's gymnasium serves the physical education needs of 650 students. The school had a total contract cost of $1,105,523 and a contract cost per square foot of $10.49.

When Are

Like talk about the weather, discussions of the overcrowding of public school buildings are general and raise more questions than answers. "Overcrowding" is a loose, descriptive term to indicate that there are more pupils within a school building than can be satisfactorily cared for. It implies that some measure of the pupil capacity of a school building is known and that the enrollment was greater than the pupil capacity of the building at a particular time.

Before construction is undertaken to relieve an overcrowded situation, the precise extent of overcrowding should be determined. One simple method is to ask any person, lay or professional, to give his opinion on the extent of overcrowding. This frequently used approach is open to criticism in that subjective opinion is based on individual standards which jeopardize the validity of the statements.

While objectivity is desirable, it is not always obtainable. One group of the researchers has reported[1] that as late as 1950, no absolute measure of pupil capacity, especially of junior and senior high schools, had been developed. Since 1950, Knezevich[2] and Conrad[3] developed formulae for measuring the pupil capacity of elementary and secondary buildings.

Nature and Functions of School Overcrowding

The first step in determining pupil capacity is related to the nature and functions of a school building. One's concept of a school building influences estimates of the number of pupils to be satisfactorily housed. To illustrate: If a school building is looked upon as just a shelter from the weather, many youngsters can be placed within a given space before it is "crowded." On the other hand, if a fundamental purpose is to facilitate the instructional process, the number of pupils who can be placed within a given space without crowding will be different. The school building protects the pupils and teachers for a purpose. Crowding interferes with the realization of this purpose. From this it follows that the educational program has an important bearing on the measurement of the pupil capacity of a building.

And again, the pupil capacity of a building changes if there is a significant change in the educational program, or curriculum, even though the physical facilities remain constant. To illustrate: Assume the educational program is to be limited to the three R's, and that the school building for this program has a capacity of 200 pupils. The capacity of this building would change, and overcrowding would result, if the educational program were expanded to include instruction in home economics, industrial arts, and physical education each of which requires specialized equipment and spaces. Unless additions were constructed, existing classrooms would have to be changed from general-purpose instruction to home economics or industrial arts or physical education. Enriching educational programs without additional rooms will, in most cases, reduce the pupil capacity of a building.

The reverse of this step is often seen. Overcrowding has been relieved by reducing educational opportunities. Thus, kindergartens have been closed or moved so that the rooms might be used as primary classrooms. Art and music rooms have been converted into general purpose classrooms, and experiences in art and music thereby reduced or carried on elsewhere. The nature and extent of the educational program housed within a given school building must be agreed upon before agreement can be reached to the extent of overcrowding.

Overcrowding and Adequacy

It is necessary to differentiate between the overcrowding of a school building and its adequacy. "Overcrowding" yields a quantitative description, while "adequacy" yields a qualitative description of the educational or physical aspect of a school building. It does not follow that a building is overcrowded if no space provisions are made for such educational opportunities as industrial arts, fine arts, music, speech, physical education, and the like. However, a building without the just mentioned educational spaces, particularly at the secondary level, is less adequate for what is at least presently agreed upon as a desirable program of educational opportunities. A difficulty met in measuring pupil capacity stems from the failure to distinguish between the adequacy of spaces to facilitate the desired program of education and the actual number of pupils that can be satisfactorily housed for that program.

To evaluate the usefulness of a school building, three separate measures are needed. One measure (*overcrowding*) is based on the rated pupil capacity for a given educational program. The second measure is an *index of educational adequacy* and is based on the number and design of educational spaces necessary to facilitate a desirable curriculum for children of elementary or secondary school age. A third measure would indicate the *physical condition* of the structure, the site, and service systems. Strictly speaking, overcrowding should be separated from the quality of service facilities or physical structure. Structural soundness, sanitary facilities, fire hazards, the quality of day and artificial lighting, etc., are not considered in the first attempts to determine pupil capacity. These physical factors are important as are also the location, size, and character of the site. These qualitative evaluations emphasize the fact that overcrowding may be worse than at first appears because the varying educational inadequacies and physical hazards contribute further to crowding. Thus, the razing of structurally unsound quarters, or the elimination of unsafe attic or basement rooms, naturally increases overcrowding before new construction is completed. Much the same could be said of attempts to improve the educational quality of a building in which general purpose classrooms are converted into spaces for instruction in special subjects or "cubbyhole" classrooms are combined into fewer large rooms.

Let us examine some fundamental assumptions underlying the measurement of the pupil capacity of an elementary school, which includes grades kindergarten through the sixth. An elementary school may be organized along departmentalized, semi-departmentalized, or nondepartmentalized lines. In the typical grade school, the pupils are under the supervision of a single teacher during a major portion of the school day. The problem of computing the pupil capacity of the building for an elementary school organized in the non-departmentalized, nonplatoon, or "self-contained" classroom system is relatively simple. Here the pupil capacity is a function of the pupil-station standard and the area of the general purpose classroom where learning experiences take place. The pupil-station standard is simply the area allotted each pupil enrolled in a class and is the foundation of estimates to determine overcrowding.

The pupil-station standard is usually stated as so many square feet allotted to each pupil: for example, 15 sq. ft., 25 sq. ft., 30 sq. ft., per pupil, etc. The real difficulty occurs when a decision must be made as to what value should be assigned to the pupil-station standard. For many years, this standard for elementary classrooms was based on the floor area required for a single desk arranged in a pattern, plus enough space for aisles needed for circulation. The standards for primary pupils were less than those for intermediate pupils because of the smaller size of the primary desks. In the 1920's one famous architect specified that the pupil-station standard for grades 1, 2, 3 was approximately 12 square feet per pupil; for grades 4, 5, and 6, a little over 14 square feet per pupil; and for grades 7 and 8, approximately 16 square feet per pupil. Later it became a rule-of-thumb that 15 square feet was the desirable pupil-station standard for elementary schools.

More recently, writers and architects point out that the classroom learning activity should influence the pupil-station standard. This is a functional development of the school building as a means of facilitating the instructional process. As teaching methods have become more and more concerned with pupil activity, educational space large enough for freedom of movement and for large student projects have become as necessary as space for furniture and aisles. Movable furniture has made it possible to arrange students in the various patterns which the learning situation demanded. Once the desk has been made movable, it can be arranged in a circle, a square, etc. This flexible arrangement of furniture according to Caudill[4]

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[1]Holy, Thomas C., and Herrick, John H., "School Plant," *Encyclopedia of Educational Research* (Walter D. Monroe, editor) (New York: The Macmillan Co., 1950), pp. 1098–1119.

[2]Knezevich, Stephen J., *Financial Ability of Local School Districts in Wisconsin to Provide Adequate School Plant Facilities* (Madison: The University of Wisconsin, 1951), pp. 71–89.

[3]Conrad, M. J., "A Capacity Formula for Secondary Schools," *American School and University*, 1953–54, Vol. 25, p. 14.

Schools Overcrowded?

S. J. KNEZEVICH

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Here is a review of some of the factors that determine the pupil capacity of school buildings . . .

makes it necessary to provide at least 25 square feet per pupil. An additional 10 square feet per pupil or more are required for instructional procedures involving some pupil activity. Accordingly, 35 square feet per pupil in a regular elementary school classroom should be provided as a pupil-station standard rather than the old, customary 15 square feet per pupil. Numerous authorities recommend a pupil standard of 20 to 35 square feet; the majority urge in the neighborhood of 30 square feet per pupil. Special classrooms, such as kindergartens, require more space.

There is no research at present which indicates the superiority of the old one-pupil-station standard over any other as far as instructional efficiency in the elementary school is concerned. Clearly then, decisions must be made on the evaluated pupil standard considered desirable for the program in hand and the methods of instruction.

To say that a building is overcrowded without specifying the pupil-station standard, is to be guilty of vagueness. To illustrate: Assume an enrollment of 500 children in an elementary building with 10 general purpose classrooms, each with an area of 900 square feet. Is this building overcrowded? If the pupil-station standard of 15 square feet is accepted, the capacity of each room is 60 pupils. The total pupil capacity of this building with 10 rooms is then 600 without crowding. If, however, the standard of 30 square feet per pupil is accepted, the capacity of a room with 900 square feet of area would be 30 pupils. The total pupil capacity of this 10-room building would then be 300. If say 200 pupils additional are enrolled under the latter assumption, then the building is operating at 167 per cent of the capacity.

It is the writer's contention that there is more overcrowding in present-day school buildings than is known, simply because the pupil-station standard is far lower than is desirable for efficient present-day methods of instruction.

Special Purpose Rooms

The preceding method is valid only if the pupil is in the same room under the supervision of a single teacher for a major portion of the day. If special teachers are available to "enrich" the program, it is assumed that when the children go to the special purpose room with a special teacher the general-purpose room remains vacant. This seemingly inefficient arrangement is justified by the lack of the elementary pupil's maturity. It is argued that the elementary children need the guidance of a single teacher most of the day and that departmentalization confuses them. Special purpose rooms are not included in determining the pupil capacity of a non-departmentalized elementary building. Where children remain under the supervision of a single teacher during most of the day, the special purpose classroom is an extension of the general purpose classroom. The library, auditorium, gymnasium, art room, science room, music room, speech room, shop, and so on are in a sense parts of the general classroom, separated from it for convenience in the placement of equipment and efficiency in instruction. The justification for not including the special rooms in the computations of pupil capacity of an elementary school rests upon the space implications of a particular concept of elementary education. It is not based on solid objective principles but rather upon a philosophy of education. In such elementary schools a special measure of determining overcrowding in special purpose rooms during one period are needed. This may or may not reflect overcrowding.

In the secondary school, as well as the departmentalized elementary school, it is not necessary to provide a general purpose room where a child must be located during most of the day. The special purpose rooms in a departmentalized school must be examined under a different set of educational beliefs. In a departmentalized organization, pupils work under several teachers during the school day. In addition to that, each pupil is allowed some freedom in the selection of subjects to be studied. Since the high school pupil circulates from one room to another during the course of the school day, the length and number of instructional periods during the school day are important elements in the determination of the pupil capacity of a secondary building. Conflicts in class scheduling must also be given consideration here when determining pupil capacity.

Influence of Program on Capacity

The formula for the determination of the pupil capacity of a secondary school plant cannot help but be complex because the educational programming at the secondary level is complex. If the program of all high school children were rigidly prescribed and constant, with all students at a particular grade level were studying the same subjects, a definite relationship would exist between total enrollment and pupil capacity of a school plant. Were this true, schools with equal enrollments would require the same number and kinds of instructional units. But when the students are permitted to select their programs of studies, the educational program becomes

[1]Caudill, William W., *Space for Teaching* (College Station, Tex.: Texas Engineering Experimental Station, A. & M. College, 1941).

a variable in the computation of pupil capacity. The writer has found in one of two schools with equal enrollments 22 class sections devoted to the study of English and social studies, and only 15 sections in this same area in the other. In the one school system, 92 per cent of the students were enrolled in social study subjects, whereas in the other only 56 per cent were enrolled. Schools have different graduation requirements and use different systems of counseling; even where total enrollments are equal, the number of sections in given subjects will vary.

This means simply that one cannot examine an empty building to arrive at its pupil capacity. The same educational plant will have two very different rated pupil capacities when used for two different educational programs. The varying space demands for secondary school subjects are to a large extent responsible for this condition. Most authorities agree that a desirable standard for general-purpose or interchangeable secondary-school classrooms is 25 square feet per pupil. On the other hand, 40 square feet per pupil is regarded as the minimum for home economics. Pupil-station standards for shops vary from 40 square feet to 75 square feet. Some standards for physical education spaces specify at least 100 square feet per pupil for a class of average size. It is this variety of standards which serves to emphasize that the same educational plant will have different rated pupil capacities under different educational programs.

Once again, an illustration: In the future it may well happen that fewer pupils will be interested in certain learning experiences. Thus, the shift may be from the study of, say, home economics which requires at least 40 square feet per pupil to subjects which require only half of that unit floor area. The increase in pupil capacity would result as the number of rooms with large pupil-station standards was reduced, and hence more pupils could be housed. The pupil capacity of the same school plant would be reduced too if students enrolled in five or six classes instead of the traditional four classes. There would be fewer students in study halls which call for a relatively small pupil-station standard. The same room used for different educational purposes calling for varying pupil-station standards would have different capacities.

Instructional Periods and Capacity

The number of instructional periods during the school day has a pronounced effect on the pupil capacity of a platoon or departmentalized school. The capacity could be increased too if the instructional units were available for seven instead of six periods per day. To illustrate: Assuming that a particular room accommodates 30 pupils, and the plant operates at 100 per cent utilization, 180 pupils could use a room during the six-period day, while 210 pupils could use the same room during a seven-period day. This is the "theory" behind half-day sessions as a method to cope with building shortages. No implication should be drawn that the writer suggests half-day sessions.

The length and number of class periods should be based on educational considerations, particularly educational methodology. If the lecture method is used, there is some justification for periods of less than 50 minutes. Laboratory methods of instruction necessitate class periods of 50 minutes or more for effective learning. Clearly then, class-period lengths should be determined by efficient instructional methods and their time requirements rather than by pupil-capacity computations. Physical education instructors desire longer periods because of the time spent in dressing and showering as well as in learning activities. Much the same is true of home economics, shop, and science subject fields requiring 50-minute or longer class periods for efficient instruction.

The writer discovered in 1950 that the majority of secondary schools in Wisconsin operated a six- or seven-period day, with median periods of 53 minutes. Approximately 83 per cent of the secondary schools utilized instructional periods of 50 minutes or more.

The so-called "floating schedule" definitely complicates the determination of the pupil capacity of a secondary school. Here we find the use of periods of 65 minutes or more in use, but only five periods are held during any single calendar day. Once again, it is emphasized that the number and length of instructional periods should be determined by efficiency in learning rather than by pupil capacity computations.

Scheduling Conflicts

Conflicts in scheduling classes hinders 100 per cent utilization of available spaces. It is unrealistic to assume that every room in a secondary school building can be used every period of the day. Allowances must be made for flexibility in programming. This fact was reported by Packer in his research, completed back in 1924.

Some school buildings do not provide office space for teachers. Teachers under such circumstances are allotted at least one period a day in large empty classrooms for counseling students, planning programs, etc. In spite of the inefficient pupil-station utilization in such circumstances, this is the only way out when teachers' offices are not provided. A more efficient arrangement, of course, would be to provide special office space, to be shared by a number of teachers. This, however, does complicate the problem of determining the pupil capacity of a secondary school building. If it is a school policy to use a room only five out of six periods a day, this must be recognized.

Special Purpose Classrooms

Certain rooms in secondary schools are equipped with highly specialized and relatively immovable instructional equipment for such subjects as science, home economics, industrial arts, physical education, music, art, and commercial education. These instructional spaces do not lend themselves to instruction in such general areas as English, mathematics, social studies, or foreign languages which do not require specialized furniture.

In determining the capacity of a secondary school plant, consideration must be given to such specialized classrooms as can be used for general purpose instruction when not in use for the originally designed purposes. To do this, however, necessitates the service of "floating" teachers, who move from one specialized room to another which happens to be vacant at a particular period. The only home grounds such floating teachers would have would be a specially provided office.

Specialized classrooms do not have a significant impact upon the pupil capacity of secondary school buildings. One can determine whether such facilities as the physical education suite, the shops, music rooms, etc., are overcrowded for their originally designed purpose. This may or may not reflect upon overcrowding in the remainder of the building.

Importance of Interchangeable Classrooms

The pupil capacity of any departmentalized building is based primarily on the pupil-station utilization of the interchangeable classrooms where instruction in such subjects as English, mathematics, or foreign languages, etc., take place. The pupil capacity of the specialized classrooms used for science, home economics, and commercial education are given some weight in the determination of pupil capacity. Highly specialized areas such as auditoriums, gymnasiums, and shops have little influence upon over-all capacity. There is some justification for this point of view since the interchangeable classrooms account for the largest percentage of available schoolrooms. They also represent a minimum kind of space for the majority of the so-called "required" subjects that demand little more than ordinary desks and bookcases. After computation of pupil capacity, one can add a further statement on the use of highly specialized spaces. Once again: The formula to determine the quantitative adequacy of a secondary school plant does not reflect the educational or physical adequacy of the plant.

Summary and Conclusions

Any attempt to compute the pupil capacity of a secondary school plant must consider: the number of daily instructional periods; the elective system and its influence upon pupil class programs; the area of interchangeable classrooms and adaptable specialized classrooms; and the uniqueness of function of specialized spaces. An additional factor which deserves special emphasis is the pupil-station standard accepted for evaluating any and all of the spaces in a secondary school plant. The importance of evaluating instructional spaces on a justifiable pupil-station standard is not overshadowed by the complicating factors just discussed.

In conclusion, it can be said that the complicated structure and organization of our elementary and secondary school buildings defies developing a rule-of-thumb for determining the pupil capacity of school buildings. Fundamental assumptions with respect to the nature and extent of the educational program and methodology of instruction must be made clear before proceeding with any evaluation. There is a close relationship between the nature and extent of the educational program and the pupil capacity.

The attractive brick exterior of the Northwest Area high school, Shickshinny, Luzerne County, Pa. — Buchart Engineering Corp., architects and engineers, York, Pa. Dr. Eugene Teter is county superintendent and Claude E. Miller is supervising principal.

Compact and Economical

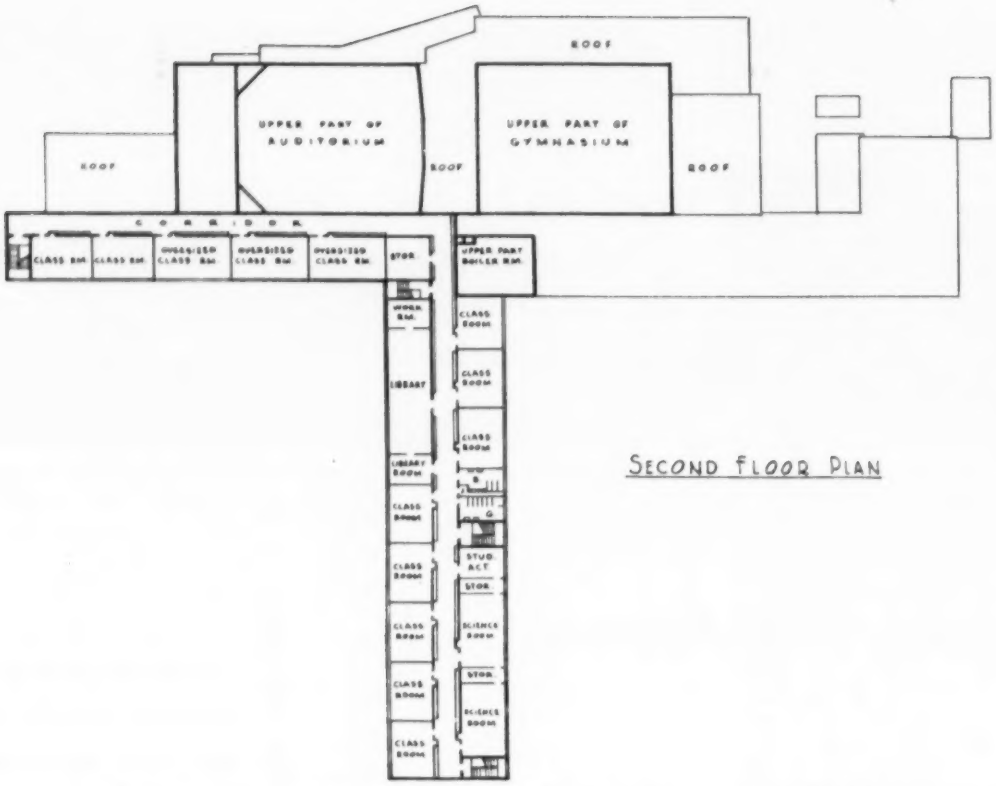
The Northwest Area high school in Luzerne County, Pa., is an example of a quality, functional school well within the state maximum cost of $1,700 per pupil

EDWIN W. CRUTTENDEN

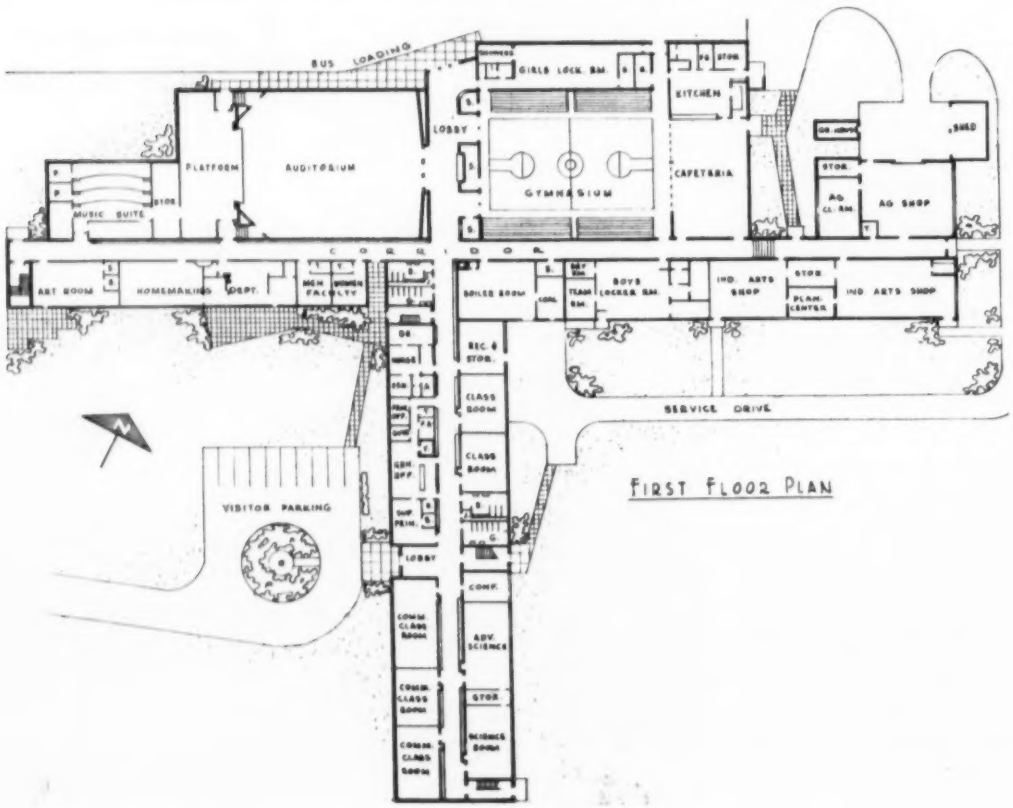
Educational Consultant, Buchart Engineering Corp., York, Pa.

The Northwest Area high school, located near Shickshinny, Luzerne County, Pa., is an outstanding example of the educational facilities and construction qualities that can be obtained within a maximum per-pupil expenditure of $1,700 approved by the Commonwealth of Pennsylvania in its state subsidy school building program on a long-lease, annual-rental lease basis. The rated capacity of the school was 745 pupils; the over-all cost was $1,250,000. The resulting per-pupil cost was $1,677.

The foods laboratory area of the homemaking suite of Northwest Area high school. Incandescent lighting, painted masonry block walls, unit heating, acoustical tile ceilings, and asphalt tile floors are provided in the academic areas of the plant.



The floors plans of the Northwest area high school, which provides 89,926 square feet and 1,499,435 cubic feet in its compact "T" design.



School Facilities

The school contains all instructional and special service rooms needed to serve diversified curricula in an extensively rural area. Included are 22 classrooms of varied sizes for teaching academic, science, and commercial subjects. Special purpose areas with adequate storage provision and built-in equipment were created for teaching music, arts and crafts, homemaking, industrial arts, and vocational agriculture.

General areas include a large library capable of seating 10 per cent of the student body, a cafeteria and kitchen, an auditorium, and a double-playing floor gymnasium that can seat 1000 persons. Other facilities are a study-activity room, teacher and pupil conference areas, a health suite, and spacious administrative offices.

Educational Planning

Recommendations of school administrators and teachers, which helped greatly in producing many educational design features, include: shops and kitchen noises isolated from rest of school; art and home-economics suites clustered around the auditorium and stage; a music suite, isolated but adjacent to the stage, with adequate storage and practice rooms provided; a library centered on the second floor among the academic classrooms; centrally located administrative offices with adjacent health examination rooms and rest facilities.

Several design and engineering elements contributed to producing an excellent building at relatively low cost. These include: minimum amount of road construction, grading, and fill; two-story, compact, "T" shape design with minimum amount of single-loaded corridors; centrally located boiler rooms with short heating and return lines; simple structural frame with non-load-bearing block and brick cavity walls.

Construction Materials

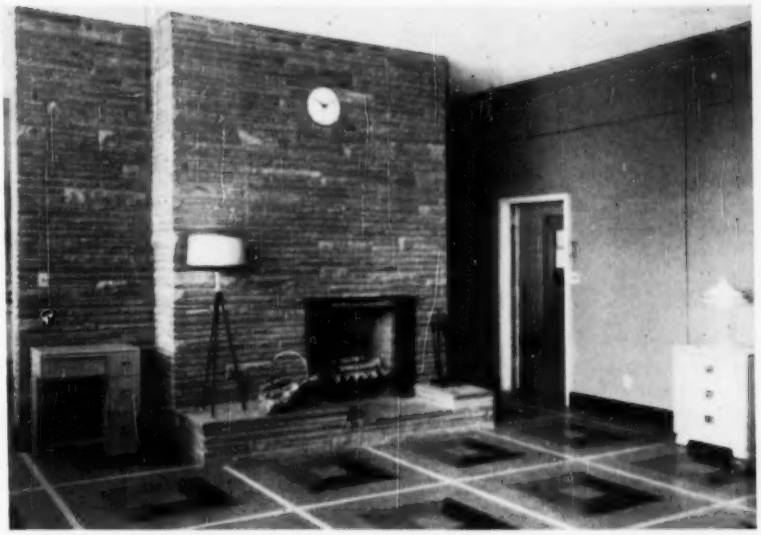
The Northwest high school utilized a basic type of steel frame construction. The floors are concrete slabs on grade for the first floor and suspended slabs on closely spaced steel joist for the second floor. Classrooms and cafeteria have asphalt tile floors; terrazzo was used for lobby and corridor floors; finished concrete floors were used in the auditorium and shops.

The wall construction is cavity type with four-inch brick, two-inch cavity and masonry block unit backup. Interior wall finish is painted masonry block with ceramic tile wainscot in corridors, toilet rooms, and shower areas. The roof is composed of steel framing, poured in place gypsum roof slabs, and coal tar pitch.

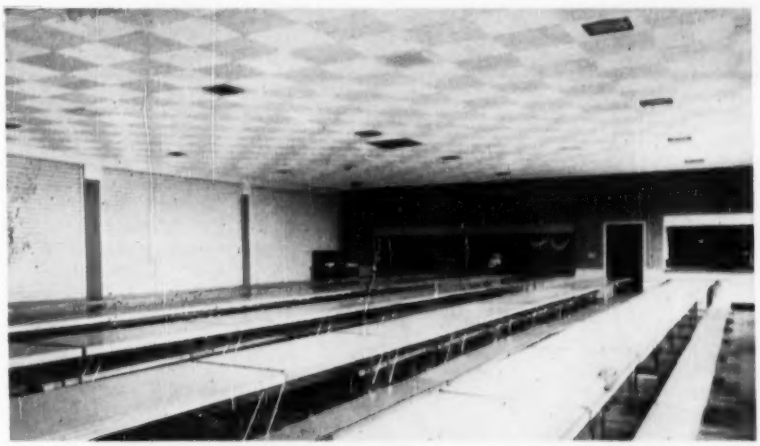
The heating is steam vacuum, vapor heat with unit ventilators, all thermostatically controlled. The boilers are stoker-fed, coal fired. Lighting in general is flush mounted and suspended incandescent fixtures.

The Cost

The plant had a total cost, including site, equipment, fees, and construction, of approximately $1,250,000. It provides an area of 86,926 square feet for a total cost of $14.38 per square foot.



One section of the homemaking suite in Northwest which offers home economics instruction in foods, sewing, and home living.



The cafeteria looking toward the kitchen. At left are rolling steel doors that divide the gymnasium and the cafeteria and that are opened to handle the overflow crowds from the gymnasium. The kitchen equipment is designed to serve from 800 to 1000 daily.

One thousand spectators can be seated in the gymnasium. A folding partition separates the gymnasium for multi-purpose use.

A report on the criteria of good visual environment and the method one school district used to re-examine the lighting in its school buildings

Using Surveys

In considering the child's activities in school one cannot help but be impressed with the tremendous influence exerted by the physical environment of the classroom. Although all environmental factors must be balanced, tasks requiring visual activity occur most frequently, and therefore the visual aspect of the classroom environment is the most important single factor. School lighting must be right, not only to expedite learning, but to prevent actual physical harm to pupils.

The importance of school lighting has led to much competent research and the establishment of accepted criteria. Basic information has been available for approximately ten years through such organizations as the Illuminating Engineering Society and the National Council on Schoolhouse Construction. Recently, an excellent nontechnical presentation of lighting criteria has appeared in the American Association of School Administrators publication, "Common Sense in School Lighting." By now, almost all superintendents, board members, architects, and other school planners should be aware of the criteria for good visual environment.

Office of the Superintendent of Schools, San Diego County

LIGHTING SURVEY

School New Solana Beach Elementary
Room No. 3
District Solana Beach

Superintendent Mrs. Dorothy H. Clark
Architect Raymond Jung

East Elevation

East Interior

Survey No. 10

Knowing the criteria for good school lighting is important, but doing something about it is not necessarily the inevitable result of having this knowledge. As in most fields, a lag occurs between research and application of research results in actual practice. In an attempt to reduce this lag, the survey techniques discussed here were used to stimulate school board members, superintendents, architects, and business managers in this area to plan school buildings that measure up to the lighting criteria set by competent research.

The Survey Program

The first phase was to determine the lighting practices of representative schools in the Southern California area. A form for school lighting surveys which had been modified and adopted by the National Council on Schoolhouse Construction under the leadership of Charles Gibson was used. Twenty-six schools were surveyed.[1] Results of these surveys were distributed to all school architects, administrators, and board members of the area. Initial result was heightened interest, but it appeared that many who saw the data were content if it showed that they were doing a lighting job not much better or worse than others in the area.

Realizing the need for more positive follow-up, some minor revisions were made on the survey form and a policy was adopted of making available a lighting survey on each new classroom unit in the county whenever requested. These requests have come in ever-increasing numbers as architects, school adminis-

[1] "A Sampling of Current Practice in Schoolhouse Construction," Office of the Superintendent of Schools, San Diego County, October, 1954.

to Improve School Lighting

FRANCIS C. DARBY

Assistant Superintendent of Schools, San Diego, Calif., County

trators, and school board members have realized that the goals of good lighting are not only desirable, but that they are essential and they are achievable.

The procedure for making a lighting survey is not too difficult for any school district with the necessary equipment, which includes a camera, a good light meter, and a spectra-brightness meter. A two-man team is most efficient as it is best to begin and finish all surveys between 11:30 a.m. and 1:30 p.m. On arrival at the school one man arranges the furniture so that the nine desk top readings can be taken. He also takes the necessary documentary pictures which show the fenestration pattern, appearance of the building and arrangement of the room. The other member of the team makes a rough pencil sketch showing the classroom walls and the cross section of the room. Light readings are then taken. Using the light meter, one man gets foot-candle readings of the nine desk tops while the second man records the readings on the prepared lighting survey form. Next, the foot-lambert readings of brightness on wall, floor, and ceiling surfaces are taken and recorded in the same manner using the spectra-brightness meter. These readings are taken from the center pupil station of the room while the surveyor is sitting down. This is done so that the foot-lambert readings will represent the actual conditions under which a pupil works.

In making our surveys, we are careful to have conditions under which readings are taken in different classrooms as nearly alike as possible. This is done by taking readings in the middle of the day and on clear days only unless some particular condition is being tested.

The completed survey form is then drawn to scale, readings are inserted, pictures are selected, and the survey is ready for duplication and distribution. Distribution has been to local school architects, school administrators in San Diego County, the National Council on Schoolhouse Construction, and to other architects and school planners who have requested copies of the surveys. During this past year surveys of 20 classrooms (each with a different lighting pattern) have been completed.

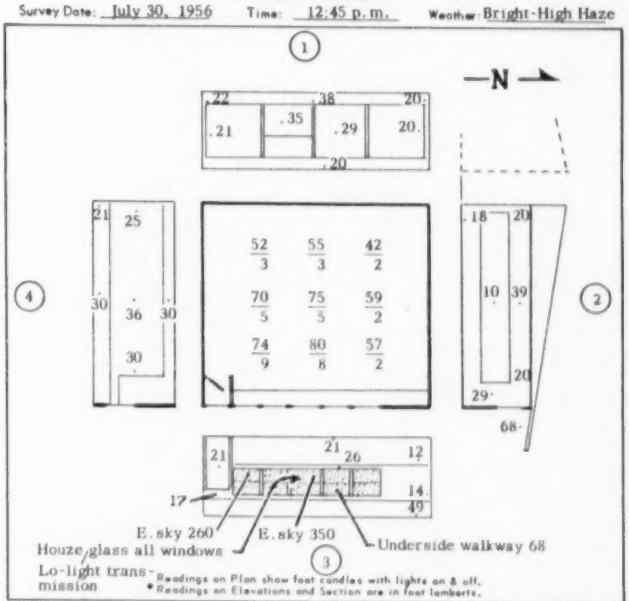
Survey Results

What have the surveys revealed? The results vary widely and show that some districts and architects are achieving excellent visual environments for pupils while others are making little or no progress. But through the surveys we have been able to discover certain basic factors which must be considered by school planners in achieving good school lighting.

In this part of Southern California, readings show that when one looks out into the sky the brightness is too great for the eye to tolerate. In regard to this, many people have had the feeling that it is enough to keep the sun from shining directly into the classroom or to arrange the classroom so that none of its occupants look into direct sunlight. Our readings show that the sky dome itself (the sky not including the sun and immediate vicinity) usually

LIGHTING SURVEY

Survey Date: July 30, 1956 Time: 12:45 p.m. Weather: Bright-High Haze



*All foot lambert readings with lights ON.

Location	Description Lights on	Foot Lambert Reading	Does Not Meet Objective
Basic Reference	Task (70% of Lowest Intensity)	29	
Desk Top	Light oak - clear	25	
Adjacent Floor	Asphalt tile (Grey)	16	
Wall #1 Hi.	Acoustic tile	38	
Wall #1 Lo.	Closet door (Green)	20	
Wall #2 Hi.	Tackboard	39	
Wall #2 Lo.	Chalkboard	10	
Wall #3 Hi.	East sky (thru Houze glass)	350	✓
Wall #3 Lo.	Bench (Green)	12	
Wall #4 Hi.	Tackboard	36	
Wall #4 Lo.	Acoustic tile	21	
Ltg. Fixture on	Flourescent tubes	100	
Adjacent Ceiling	Plastic diffusers cover ceiling	--	
Ceiling Fix. off	Maximum	9	
Ceiling Fix. off	Minimum	2	

BRIGHTNESS OBJECTIVES:

Minimum Brightness shall not be less than 1/3 task or 9 F.L.

Maximum Brightness shall not exceed 10 times task or 290 F.L. The desk & floor areas shall not exceed 3 times that of the task or 87 F.L.

Fixtures: Plastic diffuser covers entire ceiling.

Lamps: Flourescent tubes.

No. Fixtures: 50
No. Lamps: 50
Intensity of Electrical Lighting in Foot Candles:
Maximum 72
Minimum 40
Average 58

has brightness readings of 1500 to 4000 foot-lamberts. The range is due to variations in haziness, clouds, angle to the sun, and time of year. For example, a white cloud in certain positions can more than double the brightness.

These brightness readings have also shown the fallacy of the old idea that north light does not produce glare. It is true that north windows do not admit direct sunlight into the classrooms, but the north sky often has very high brightness which, contrasted with the light conditions within the room, produces severe glare. In other words, it is the brightness of the sky that is important, not whether the light source is in the north, south, east, or west.

These sky dome sources of high brightness can be controlled in a variety of ways — by overhangs, louvers, low light transmission glass, placement of windows, use of sky lights, or the planting of trees and shrubs. Several of the schools studied used overhangs or covered walkways which successfully eliminated the possibility of looking directly into the sky. Similar overhangs in other schools did not completely eliminate direct sight into the sky, sometimes leaving small strips of high brightness which contrasted so greatly with the overhang that the result was greater contrast and therefore greater glare conditions than would have been true without overhangs. Our conclusion is that overhangs will not automatically cure glare — they must be oriented properly in relation to different positions of the sun. With permanent louvers, too, it seems that very close supervision over the contractor must be exercised. We found three schools which had louvers set at such an angle that strips of sky were visible, with the consequent glare problem. The architects had correctly designed the louvers but the carpenters had not been sufficiently aware of the importance of installation to exact measurement.

Some schools have used outside louvers that are adjustable. This creates an additional duty for teachers. Orientation under varying conditions is important here also. For example, one of the schools surveyed has very extensive installations of movable louvers, but the survey showed that when the louvers were opened enough to provide sufficient daylight for students' tasks the sky dome was visible and very high brightness readings resulted. When the louvers were closed to a point where the sky glare was eliminated there was insufficient light for the students' tasks without the use of electric lights.

Special glass to reduce glare has been tried in several of the schools studied. In one case it was discovered that a hammered obscure glass produced higher brightness readings than adjacent clear glass. Some tinted glass has been used successfully to shield out sky brightness in windows where it is not necessary to see out. Low light transmission glass has been used in many cases where it is necessary to shield the classroom from high brightness sources and yet enable the occupants to see out. At one such installation, however, it was discovered that when the windows with low light transmission glass were opened for ventilation it was possible to see sections of the bright light source and this high brightness in contrast with the darker glass produced very unpleasant glare conditions.

High windows and skylights can eliminate direct views into the sky dome if the openings are properly shielded, but they also pose some serious problems in terms of control, particularly when the rooms are to be darkened for projection of films and similar materials.

Occasionally good use has been made of existing plantings or hillsides with vegetation as a means of controlling glare. A row of trees which cuts out direct view of the sky and yet allows light to enter the classroom can be an almost ideal situation, but it seems that we seldom plan for such a condition.

As a last resort it is possible to use blinds, either Venetian or roller, to control sky brightness. This is frequently a very unsatisfactory method as it may eliminate too much light, prevents seeing out, and is very hard to control properly. In surveying a school which had several classrooms equipped with Venetian blinds, it was found that none of these rooms had the blinds properly adjusted. In a single classroom some blinds were halfway down, some all the way down, some adjusted to keep out all of the light, and some adjusted so that the sky brightness could be seen between the slats. To keep such devices properly adjusted requires more attention than a teacher should be asked to give to the problem.

We found that architects have been doing an excellent job with color combinations and have been given due consideration to the reflection factors of the paint used so that a good balance existed between the brightness on walls, ceilings, and floors. School people, too, have kept pace in the selection of furniture and equipment, and in no school studied did we encounter any of the "old school brown" furniture.

Electric lighting was found to be not always good but in most cases satisfactory. The surveys occasionally revealed electric light fixtures which had very high surface brightness readings. There seemed to be a trend toward more fluorescent lighting fixtures when the lighting of the schoolroom is designed to be electric rather than daylight.

A Survey Example

An example of the survey is the New Solana Beach Elementary School where Mrs. Dorothy H. Clark is superintendent and Raymond Jung is the architect. This building was developed in an experimental manner to get further answers on light control. It is a back-to-back building with six classrooms — three facing east and three facing west. There were actually five different lighting situations in these six classrooms, but only one is shown here. In all of the rooms lighting is one hundred per cent artificial with a plastic ceiling lighted from above by fluorescent tubes. This lighting produced good even desk top illumination in all of the rooms. On the east side, where one of the two panes was low light transmission glass, the east sky under the clear glass reached very high and unsatisfactory readings.

With low light transmission glass in both panes the reading was only slightly higher than the criteria and it could well be noted that if the criteria were applied at any other than the point of lowest reading in the room then the readings through the low light transmission glass would be within limits.

On the west side of the building similar conditions were discovered with bare ground giving readings which were entirely too high. The district has planted the banks on the west side, and with a minimum of low shrubbery will be able to keep all the west readings within the limits of the criteria.

A forced air heating and ventilating system takes care of all of the ventilating problems in this building as none of the windows are designed to open. Such an arrangement also makes it possible to darken the room for audio-visual purposes with Venetian blinds, roller blinds, or curtains, as one of these devices would interfere with the operation of the windows or the ventilation of the rooms.

Some Conclusions

We are again at a point where we must answer the question as to whether or not there are going to be practical results as outcomes of these lighting surveys. We have set as practical achievable goals these objectives:

1. *Lighting that is not harmful to the eyes of pupils.* All brightness ratios within classrooms should conform with the criteria set by the National Council on Schoolhouse Construction, that is: The foot-lambert brightness of any surface viewed from any normal standing or sitting position in the schoolroom should not exceed ten times the foot-lambert brightness of the poorest lighted task in the room. The foot-lambert

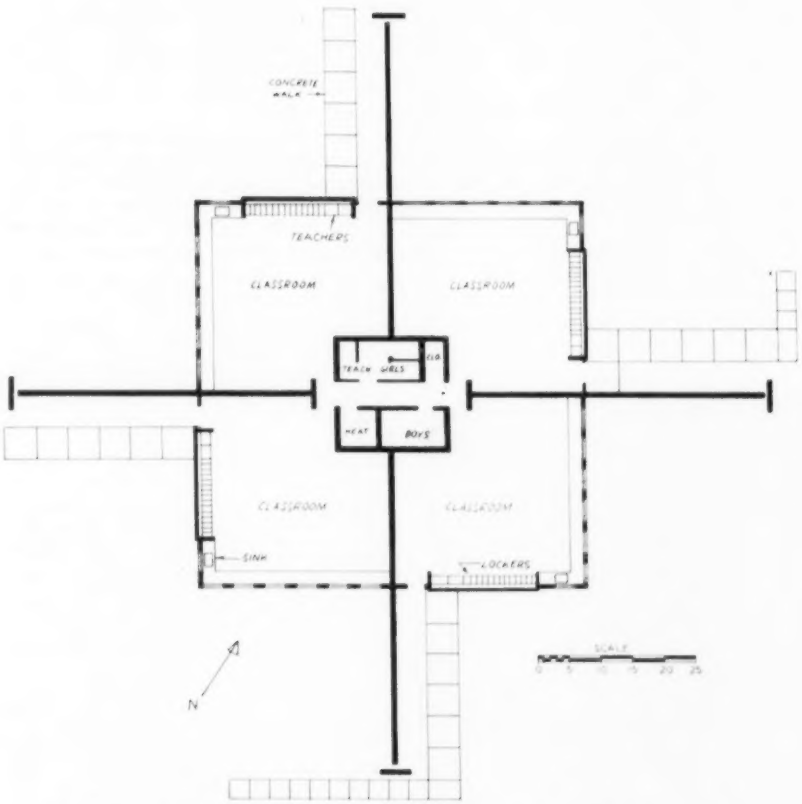
(Concluded on page 94)

Solving a Special Building Problem

"Considerable distance and two heavy traffic arteries" created a need for a special school for primary age children in a suburban area of Boulder, Colo.

A Modern Neighborhood School

STANLEY B. BROWN
School of Education, University of California, Berkeley, Calif.



The floor plan of the Park school in Boulder, Colo., with its corridorless room arrangement. The building cost $15.24 per square foot for its approximately 3700 square feet.

The Park school in the Highland Park subdivision of Boulder, Colo., is successfully meeting a unique need.

Primary age children in the newly developed Highland Park area had no school. Because this southern part of the city is separated from other areas by considerable distance and two heavy traffic arteries, a special situation was created. The vehicular problem of a freeway isolating this community is common to fast-growing suburban areas.

The Solution

The Boulder board of education felt that a "neighborhood school" would best meet the needs of the children in this area. A small, centrally located school would eliminate the obvious hazard of children crossing heavy traffic to distant schools until they are more mature.

Park school accommodates children in the primary grades within its four-room structure. The school plant is located at the north end of a 2¾ acre, irregular,

An exterior view of the separate entrance and extensive overhang of roof in the Park school in Boulder, Colo. — Bernard N. Cahlander, architect, Boulder, Colo. Dr. Natt B. Burbank is superintendent at Boulder.

triangle-shaped plot that is owned jointly by the Boulder public schools (60 per cent) and the City of Boulder, Colo. (40 per cent). In this financial arrangement, the nonschool portion of the block will be maintained as a park area by the school district during the school months and the city will assume this responsibility the remaining three months in the summer. Grass, playground, and appropriate recreational equipment make up the functional features of this joint school district-city enterprise.

The simple plan with its obvious lack of the usual corridor space is one of the impressive features of Park school. In this simple floor plan, the customary hall or corridor space has been practically eliminated in the interest of economy. Obviously, there is no proposal for future expansion because the building lends itself as only a specialized small neighborhood school for children of primary age.

Construction Materials

The rooms are identical and were designed to accommodate up to 30 pupils per room. The artificial lighting is fluorescent with two rows of lights extending into each room at a nine-foot level from the asphalt tile floor. A birch motif for furnishings and interior together with green chalk board and cork bulletin board areas offer a pleasing appearance. Seating is not secured for versatile movability within each room. Built-in units on one wall of each room contain lower vertical partitioned cloak areas and teacher storage areas above. Originally the upper storage cabinets were covered with doors that hinged from the top; these were replaced by horizontal sliding doors to eliminate the hazard of a lifted panel injuring a teacher by its falling or being returned to the closed position. Excessive glare through the two window walls caused by bright morning and afternoon sun and reflected light during snow months posed an additional problem. This was structurally met by providing exterior brick wall extensions which provide shade as well as wind protection for the individual room entrances. Venetian blinds and drapes further control the natural lighting.

The poured concrete foundation, with asphalt tile floor surfaces, has ducts within the concrete slab running from the centrally located heating unit. A 250,000 btu forced air, natural gas unit has proved satisfactory for the rather severe winter climate in the rocky mountain area. The heating ducts extend along the rear of the window shelf areas in each classroom.

Landscaping includes low shrubbery adjacent to window areas that receive maximum sunlight. Attractive ground cover, trees, and grass complete the setting. The built-up roof was desired to blend with the surrounding moderately priced, three-bedroom houses.

The need for a small neighborhood school that blends with the surrounding homes has been achieved at Park school. Such ideal features as attractiveness, functionality, economy, convenience, and practicality make the school more than just another new school in a new neighborhood.

The third grade unit in the Park school, illustrating the movable seating, the chalkboards and bulletin boards. The small group activity corner of the room is shown on page 55.

A basic project in teacher "self-help" . . .

St. Paul Builds a Demonstration and Research Classroom

NOLAN C. KEARNEY, NED FLANDERS, and EUGENE G. FLYNN

For many years, teachers, supervisors, and administrators in St. Paul have been co-operating in programs for the improvement of instruction. Much of this work has helped to put into practice a curriculum based upon recent research in such areas as the psychology of learning, social psychology, and individual differences.

In an opinionnaire prepared and circulated five years ago among elementary teachers by a teacher-selected committee, 410 St. Paul teachers said that they believed accessible demonstration classes would be of value to them; only 25 disagreed, and 20 expressed doubt. Three hundred and sixty-four teachers expressed a desire to observe such classes. Seventy-seven teachers expressed a willingness to demonstrate classroom work before groups of observers, while 255 expressed a willingness that individual teacher-visitors observe their classes. Administrators and supervisors were also convinced that demonstrations would be of great benefit.

Demonstration Experiment

Growing out of these expressions of opinion, a careful assessment was made of present needs in St. Paul for the improvement of teaching through the use of demonstrations. It was finally decided to experiment with a classroom especially constructed to facilitate observation, evaluation, and careful research into the many factors that go to make up the most efficient learning situations. Many of our teachers and administrators had participated in the human relations research laboratory at the University of Minnesota. Many were familiar with some of the possibilities for research where actual classroom work is in process.

It was decided to construct a classroom suitable for recording, observing, and doing research in one of our new junior high schools. Dr. Ned A. Flanders, associate professor of Educational Psychology at the University of Minnesota, and staff member of the Laboratory for Research in Social Relations there, served as a technical adviser in planning the physical details for the room. The complete planning committee was composed of the four assistant superintendents and the consulting architect in the St. Paul public schools and representatives from Ellerbe and Company, architects and engineers, who were retained to design the building. The new building is completed, and the demonstration room is being put into full use.

At least during the preliminary phase of the use of the room, it will be used for regular classes when not used for its own special purposes. In appearance, the room is much like others in the building from the point of view of the students. The main differences involve extra soundproofing, partially hidden microphones, conduit outlets, and one-way glass observation panels along one wall. These technical details were not camouflaged, but were partially hidden so they could be easily forgotten. It would seem unfair to expect children to submit to observation without knowing that they were being observed. Hence, there was no desire to hide the accessories.

From the standpoint of an adult or an observer, a laboratory classroom should provide space and facilities for observation from properly designed galleries. It should be possible to hear what goes on in the classroom through sound amplification equipment, yet allow conversation among observers without disturbing the students. The room should be so "isolated" acoustically as to be ideal for possible radio or sound recording use. There should be separate access to the observation rooms. There should be special storage space for extra sets of furniture designed to permit use of the room for a wide range of activities and age spans of students, and for the temporary use of more elaborate installations. Ultimately, special equipment

Dr. Kearney is assistant superintendent of the St. Paul, Minn., schools; Dr. Flanders is associate professor of Education at the University of Minnesota in Minneapolis. Mr. Flynn is consulting architect with the St. Paul public schools.

The sound equipment controls (right) in the viewing room and the classroom (below) with its one-way visibility windows.

should be provided, such as tape recorders and perhaps pen-and-ink recorders to be used for more accurate observation in the event that research makes this advisable. The room was wired so that numerous microphones spaced and designed to pick up ordinary lesson sounds anywhere in the room would lead to a loud-speaker or tape recorder or both in the observation room. The room has soundproofed walls, double acoustical windows, cork floors, and acoustical ceiling baffles.

Uses for Classrooms

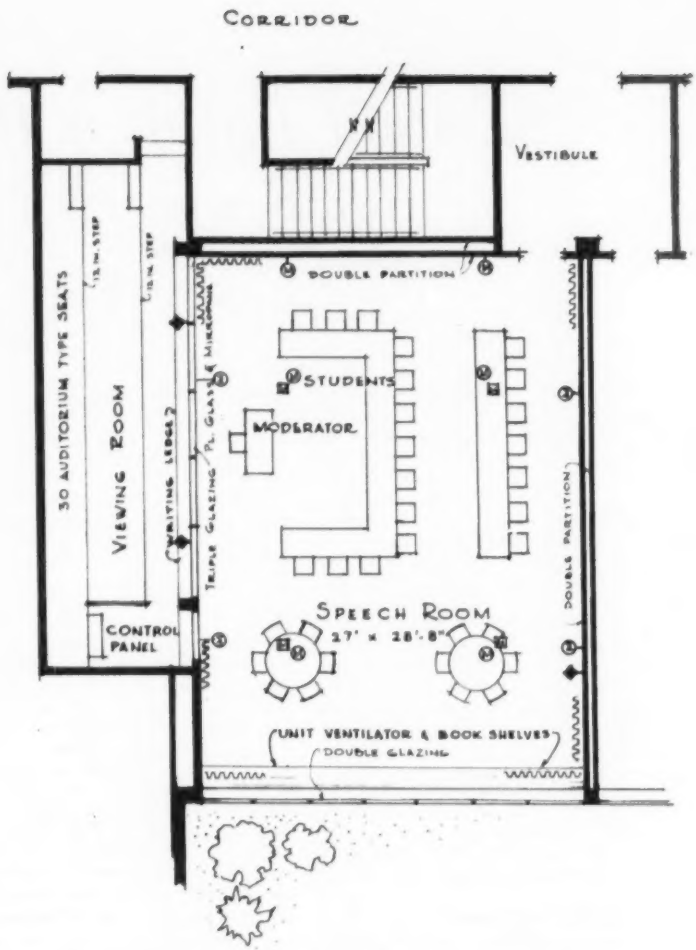
A laboratory classroom such as this may be used for demonstrations for in-service training, for showing new techniques to parents and other lay citizens, for work with students on student council, self-government, and P.T.A. studies; and for conducting systematic research projects. A few examples may serve to illustrate how observation and research can be carried on, either separately or in some combination. Frequently, teachers wish to observe their fellows who have attained unusual success in certain types of work with children. This room will permit such observation under the best of conditions.

Teachers who wish to improve their ability to teach need to experiment with different methods of instruction. Too often, this is a private affair. Frequently a teacher tries out an idea that grows out of his usual methods and, in the process, gains an intuitive feeling that the new method is better, not as good, or in most cases, not really very different from his old methods. The matter usually drops right there because of the difficulties in making careful observations while being busy with teaching duties. Furthermore, the insights that may have been achieved are not easily communicated to other staff members and are even harder to prove.

Perhaps a laboratory classroom can be used to alter this pattern drastically. First, ideas can be tried out with observation by co-operating staff members. Several opinions may thus be made available to suggest *why* differences do or do not result. Second, because it is more than a one man experiment, there may be social reinforcement among staff members. (The excitement of exploring new methods and ideas is highly contagious.) Third, the nature of the enterprise requires systematic planning, and thus the ideas under test are more likely to be significant. Fourth, participation itself may sharpen the skills of observing human behavior with a resultant increase in the objectivity and sensitivity of co-operating staff members. Fifth, the acceptance of evaluation may lead to the objectification of observation and the development of better criteria of excellence. This would be necessary to carry on carefully designed research programs. For example, with the help of a technically qualified social scientist, teachers might design systematic research that would permit them to classify teachers' statements, to classify student behavior resulting from various types of classroom situations, to make measurements of students' attitudes toward the teacher, and toward different styles of teacher behavior.

Possible variations of the training and research functions of an observation room are too numerous to mention. Certainly one thinks immediately of master teachers demonstrating new techniques to other interested teachers who have been released upon their request to attend. One thinks, too, of in-service training meetings occurring regularly each month with opportunity to discuss and demonstrate new ideas. There could be experimental sessions of a research project observed by teachers who will later hear the final results. It would be possible to hold both daytime and evening demonstrations for interested parents and other citizens.

One rule has been established in advance by the Curriculum Department that at no time will observers be admitted to the observation room without the *knowledge of the teachers and the class*. It would seem to be a violation of personal and professional rights to have it otherwise. All visitors, including casual visitors, are requested to confer with the teacher who has been observed in order that the teacher and the visitors may learn as much as possible from the experience. A visitor should know (ask if necessary) why certain things were done. The teacher should explain briefly what was under way. The visitor should feel free to react frankly to what he has seen.



A floor plan of the demonstration and research classroom in the Hazel Park junior high school, St. Paul, Minn. — Ellerbe & Company, architects, St. Paul; Dr. Forrest E. Connor is superintendent there.

"Self-Help" Project

The provision of space and equipment is no guarantee that any of the foregoing outcomes will occur automatically. Teachers and administrators will have to learn how a laboratory classroom can best be used. The first step is to develop interest in the use of such a facility on the part of the faculty. Sooner or later, however, demonstration and research provisions of some kind will become necessary in all school systems if we are to do more than give lip service to the notion that teachers should work together co-operatively in improving their ability to teach. St. Paul is embarking on an interesting project in self-help.

SCHOOL HEATING

NEW TRENDS IN HEATING SCHOOLS*

GEORGE H. BUSH

Specialist in School Building Maintenance and Operation
Purdue University, Lafayette, Ind.

Since the earliest times, school authorities, architects, engineers and builders have attempted to provide desirable classroom environment in school buildings, from the one-room country school to the complex, many-room type of structure that has been developed in large urban areas.

From the first there were many problems of determining the proper comfort conditions, which was due to combining the elements of temperature, ventilation, humidity, and infiltration of outside air. In many cases, especially in the more rigid climate areas, comfort conditions were attempted by observing only the temperature element, which resulted in creating an unbalanced condition of hot, dry, stale environment that was unhealthful and not conducive to normal active pursuits in the school environments.

Attempts to correct the poor school environments and to provide for balanced comfort conditions were made through the establishment of state building codes. These codes required the installation of pertinent ventilating equipment with adequate temperature controls to provide steady, even conditions that have flexibility for the needs in each individual area.

As educational standards changed, there was a move to consolidate schools, resulting in a shift to multi-room type of school plants, that led to a change in the type of school heating system with its auxiliary ventilating and control equipment.

At first, the multi-room schools put in a "space heater" unit in each room or area, using wood or coal as fuel. This was followed by the development of central warm air furnaces, which was then followed by the creation of central hot water or steam heating systems with various types of auxiliary ventilating and control equipment.

The development of new types of fuels for school heating was simultaneously progressing with the use of oil and gas and finally the possibility of electricity.

Electricity for Heating

Electrical heating was used in a minor way for heating small areas in the southern area of the U.S.A., the southwestern areas, and the west-coast areas as early as the 1920's but the electric units were cumbersome, inefficient, and expensive to operate. It is only during the last few years that refinements were made to assure reliable, efficient, effective units for electrical heating.

In most areas it is found that the school heating problem is one that is classified as an "intermittent load" on the heating plant. Even though the heating plant must be designed for the maximum load, the majority of the time the plant may be operating at very light loads from 10 to 50 per cent capacity. This may result in poor efficiency and poor economy for the fuel used.

The recent development of electrical heating units for school buildings and facilities has been brought about mainly through the need for the conservation of the base fuel sources, namely: coal, oil and gas. These fuels can be used at a higher efficiency in central power plants or high pressure generating stations than they can be used in small plants at light loads and low efficiency.

Another factor was the possibility of providing a cleaner environment around school buildings by the use of electrical heat. This would eliminate the problems of coal, ashes, oil, and soot that are always present with using organic fuels of any type.

As early as the late 1930's, school administrators, architects, and engineers were thinking of heating school buildings by electricity rather than by other means, but several problems seemed to retard or hinder them in making such a transition. These were as follows: prohibitive power rate for electricity; inadequate power sources; inefficient electrical heating units; costly ventilation with electrical units; inadequate control equipment; local pressure on school boards to continue the use of coal, oil, or gas; reluctance of architects and engineers to consider electrical heating units.

Overcoming Obstacles

The first two problems of prohibitive power rate and inadequate power sources have already been met to serve homeowners for heating purposes by giving special rates to home development areas who agree to use electricity exclusively for all purposes. This is no problem in those areas where the power rate is reasonable, but it is more complex in inland areas where power is supplied by steam generating plants, sometimes quite far removed from the area to be served. Indications are that the public electrical utility companies will welcome the opportunity to provide ample power sources for electrical school heating at reasonable rates, if school authorities are willing to use their services.

The third problem of supplying adequate, efficient, electric heating units has been solved at least part way and will no doubt be improved upon as demands increase. Units have been developed by several companies to provide very efficient units of several different types and sizes with close range controls to regulate adequate heating and ventilation conditions in any school environment. These electric heating units have been developed to do the job and meet the code requirements in the various states for ample heating and ventilation requirements.

The fourth and fifth problems indicated that these same electric heating-unit companies have developed efficient, sensitive equipment to provide adequate ventilation at reasonable cost for classroom areas. This has been accomplished by using clock type control equipment to provide adequate daytime temperature ventilation conditions and then to automatically provide only the minimum heating and ventilating conditions when the areas are not used.

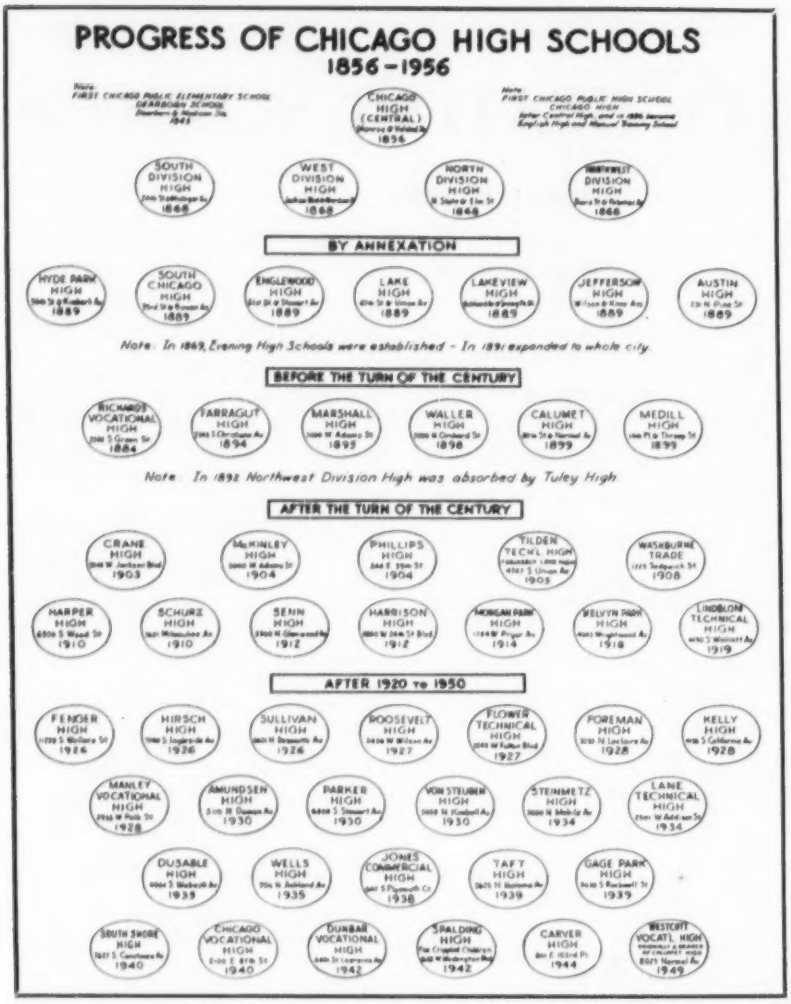
The sixth problem showed that there is still the presence of local pressure by various interested parties to continue to use coal, oil, and gas as a fuel for school buildings. This is to be expected in these areas where such fuels are abundant and cheap, but in the majority of areas this is not the case.

Where did the great upsurge in interest arise in this new possibility for school building heating? This came about because the local and regional electric utility companies were in a great expansion program on the one hand and on the other hand were seeking additional power loads in the cooler or the cold-month periods to balance the growing demands for power for air conditioning equipment used during the warm months. This led to promoting electric heating in homes and small commercial buildings followed by a desire to expand this form of heating for school buildings.

What are the advantages of using electricity for heating school buildings? Some of the more pertinent points to be considered for electrical heating are: cleaner environment; more sensitive controls; more efficient use of energy; more flexibility; lower first cost; less custodial services.

The cleaner environment is brought about by the absence of coal, ashes, oil, and gas fumes and the elimination of soot or smoke. The closely adjusted controls maintain temperatures at a half-degree variation that provides maximum comfort. The electric heating units are designed to give nearly 100 per cent efficiency of the electrical energy used. Maximum flexibility is provided by the ease of adding new circuits or reducing old ones as conditions vary. Lower first costs of the total building is possible by the elimination of the boiler room, coalbin, stack, pipe tunnels, ventilation ducts, etc.

*Adapted from an address given by the author at "The National Council on Schoolhouse Construction," Washington, D. C., Oct. 4, 1956.



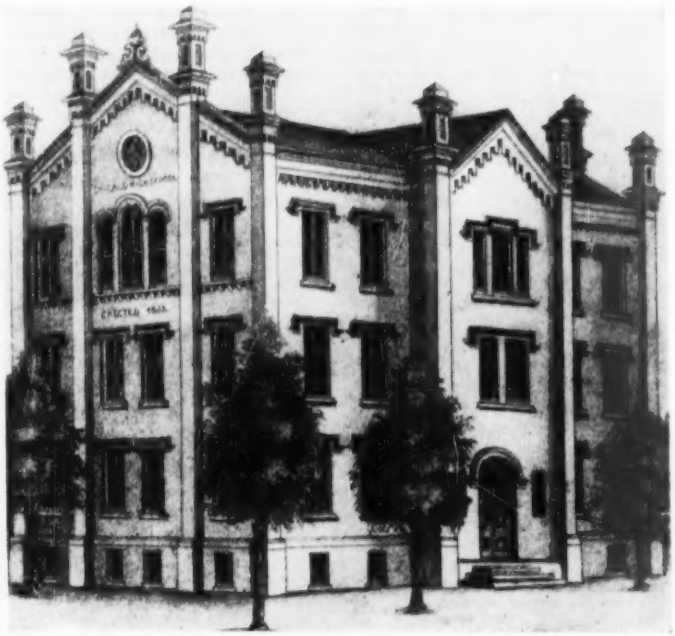
Chicago's

JOHN F. DELANEY
Director of Public Information
Chicago, Ill., Board of Education

Public school education in America has taken many forward strides during the past 100 years. The "Little Red Schoolhouse," except in very remote areas, has been replaced by modern edifices of stone and steel.

This forward look in education was particularly portrayed in the recent Centennial Celebration of the first Chicago public high school, which opened its doors to students on October 8, 1856. The original building at Monroe St. near Halsted stood as an historical monument until recently when it gave way to progress: an

In physical facilities and in curriculum, the story of development of secondary education in Chicago is one of a successful effort to keep pace with the demands of a growing metropolis



CHICAGO HIGH SCHOOL: The beginning of the Chicago high school program. Built in 1856, it offered a predominantly classical curriculum to 144 students.

High School Centennial

extension of the new superhighway which travels northwest from the Congress St. expressway.

The story of the development of Chicago high schools from this 144-student plant to the present days with potential accommodations for 107,000 boys and girls is a story of a successful effort to keep pace with a growing metropolis. The story reflects the thought and actions of many boards of education over the years — each body made up of men and women who volunteered their best thoughts and actions in the interest of Chicago's children.

It is quite a span from the three R's of the early days to the more modern practices and innovations of the 1956 diversified courses of instruction. A balanced curriculum today supplies the educational needs of every student. Fine classrooms, gymnasiums, libraries, kindergartens, adjustment services, health and child study services are extensive and highly developed.

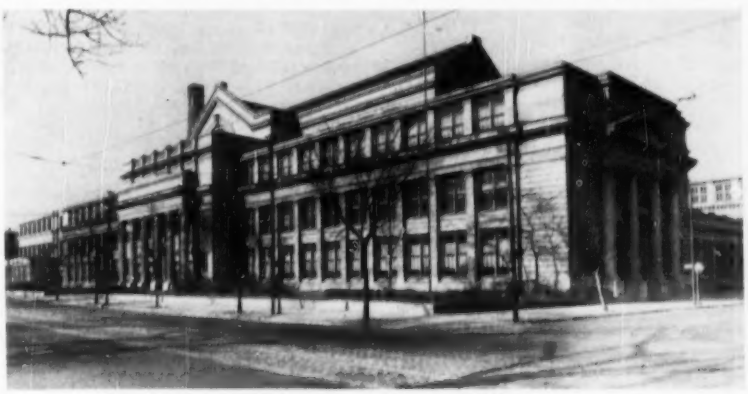
The Second School Century

As the dawning of the next one hundred years of Chicago public high schools brightens the horizon, the future — especially in the early years of the second century — will be dominated by the progressive thinking of today's board of education members and the general superintendent of schools. Their co-operative endeavor in the allocation of two $50,000,000 school building bond issues will improve the school-housing situation in Chicago materially. The first decade, at least, of the "new future" will become a lasting tribute to the educational work of this group. Under their recommendation, the second of the 50 million dollar bond issue has been anticipated for expenditure of $12,000,000 for new high school classrooms; $27,000,000 for new elementary classrooms; $4,000,000 on replacements and rehabilitations. Many of these facilities will be part of the next one hundred years.

Planned too, for early action in the Chicago school system, is the broadening of the scope of the Chicago Teachers College and the Chicago City Junior College.

LAKE VIEW HIGH SCHOOL

Replacing a structure built in 1874, the new Lake View high school was built to serve an area of Chicago annexed to the city in 1889.



HYDE PARK HIGH SCHOOL

Revealing a classical trend in school architecture during the 1920's and 1930's, the new Hyde Park high school served an area that also was annexed to Chicago in 1889.

DUNBAR VOCATIONAL SCHOOL

A preview of what is to be expected from the "Second Hundred Years of Chicago Educational Progress" is the Dunbar Vocational school, nearing completion on Chicago's south side. Conceded to be one of the finest and most complete schools of its kind, the plant will cost "upwards of $5,000,000."

WORD FROM WASHINGTON

About the School Construction Stalemate

ELAINE EXTON

Obtaining adequate classrooms for America's children and youth looms as one of the most serious domestic problems of the nation in 1957. The latest government figures show no appreciable abatement in this educational crisis as a new year starts.

Still a National Problem

According to U. S. Office of Education estimates, 247,000 additional classrooms were needed in September just to catch up with the enrollment increase of 5,000,000 pupils occurring since the school year 1952–53. Another 80,000 to 100,000 schoolrooms are required, in the view of educational authorities, to replace obsolete, unsafe, and otherwise unsuitable structures and take care of population-mobility needs in this same four-year period.

States and communities have been increasing their school construction effort in the face of this mounting deficit with the result that about 63,000 classrooms were built last year compared to 48,000 four years ago. At the current rate of construction, however, it would be many years before the nation's school plant shortage, swelled by 11 consecutive years of expanding enrollments and backlogs developed during the depression and war periods, would be eliminated.

Considering that almost twice as many children were born in the United States in 1956 as in 1936, it is easy to understand Secretary of Health, Education, and Welfare Marion B. Folsom saying: "Despite this progress, schools are not being built nearly fast enough. To meet the urgent needs of our children, classroom construction must be increased still further to erase the backlog of shortages much more quickly." At least 840,000 pupils are being deprived of full-time schooling in the current academic year through half-day or other part-time arrangements due to increased enrollments combined with school plant and teacher shortages, reports the NEA.

Since schoolhousing has a significant relation to the providing of sound instruction and an environment conducive to pupil learning and growth, the amelioration of this situation has a special urgency in these times of international tension when our very national survival may ultimately depend on the quality of educational opportunity available to America's young citizens.

Program Proposals

At this writing, all that can be predicted with certainty about the status of general-aid-to-school construction legislation in the new Congress is that separate bills will be dropped into the legislative hopper of both houses in January embodying the main features of the chief contenders for action in the previous Congress.

Despite some announced modifications in the offing, it seems likely that the major differences between the Republican and Democratic approaches will continue to center on the direct grants-in-aid provisions — the amount sought, apportionment methods, and length of program.

In his special school aid message to Congress a year ago, President Eisenhower proposed that Congress establish a five-year program to erase the classroom deficit entailing:

1. Federal grants totaling $1,250,000,000 at a rate of $250 million annually for five years to be matched with state funds for supplementing local construction efforts in the neediest school districts.
2. An authorization of $750 million for federal purchase of construction bonds of school districts that are unable to sell them at reasonable interest rates.
3. Federal advances to provide reserve funds for bonds issued by state school financing agencies which would be used to finance the construction of schools to be rented and eventually owned by local school districts.
4. A $20 million authorization over a five-year period to help states defray administrative costs in developing programs to improve the ability of states and local communities to finance school construction projects.

Regretting that the country had lost one of the "five precious years" embraced in his $2 billion program through the failure of the 84th Congress to adopt his measure, President Eisenhower declared that to get the schools we need on schedule he would "call upon the next session of Congress to enact legislation that will do the job — not in five — but in four years."

In presenting his proposals for coping with the delay, Representative Augustine B. Kelley (D., Pa.), who last year introduced the Committee bill (H.R. 7535) that touched off bitter House debate, stated his intention of sponsoring new legislation in January that might ask for between $600 million to $1 billion annually in school construction aid over a five-year period as compared to the $400 million sum that H.R. 7353 requested annually over a four-year span.

In discussing his position, Congressman Kelley stressed that his new bill will contain the same flat-grant formula for distributing federal money he previously proposed — namely, allocation on the basis of each state's school age population (5–17 years), the money to be matched by state and/or local funds on a 50-50 basis.

This is in contrast to the equalization principle President Eisenhower advocated for apportioning federal aid. This was according to relative need as measured by a state's per capita income so states with the lowest income would receive relatively more than the states with higher income. Moreover, the low income states would have to put up relatively less in matching funds. Also, in order to assure maintenance of state effort in financing education, the Administration's program would reduce the allotments of states noticeably lagging in their efforts to support public schools.

With the exception of these requirements the Kelley plan, which originated as a compromise measure developed by a special House Education and Labor Subcommittee which he chaired, contains provisions for government purchase of local school bonds and federal advances to assist state school financing agencies that are substantially the same as those the President recommended.

Accomplishment or Stalemate?

Whether the afore-mentioned measures will progress even to the point of floor debate in the new Congress is in the realm of speculation. And even if such school construction legislation should be called up again for action on the House floor whether the outcome would be different than in the preceding Congress is a matter for conjecture.

Political imponderables and deceptive crosscurrents, whose influence cannot be accurately appraised as yet, make it impossible to foretell what the 85th Congress has in store for federal aid to school construction. Events still in the making could facilitate passage or result in harsh rejection.

For a striking illustration of how concern for the future of the nation and the well-being of its children can be lost sight in a fog of the political irresponsibility that may occur with a Republican executor and a Democratic legislature, one need only to recall the jockeying for political advantage over the formula for distributing federal aid and evasive buck passing in assigning blame for the defeat of school construction legislation in the 84th Congress. Each side censored the other for choosing to play politics instead of facing up to the acute need for classrooms.

Symptomatic of the Democratic-Republican split were such charges as Senate

GOP leader William F. Knowland (Calif.) made that what the President wants is legislation to help build more schools in needy states and areas "rather than a pork barrel bill spread out all over the country" and countercharges offered by House majority leader John W. McCormack (D., Mass.), among others, who protested neither party "would stand for" such a "need" test as the Administration's program calls for which it was alleged "would discriminate against some states and put others in the position of begging for help."

Hardly had the final vote rejecting the Kelley school aid bill been tallied when leaders of both parties started issuing statements pinning this failure on their opposite numbers — accusations which grew in heat and volume as the election campaign progressed.

Democratic leaders accused Republicans of seeking to woo the Negro vote by adopting an amendment offered by Representative Adam Clayton Powell, Jr., (of Manhattan) requiring "that there shall be no federal funds allotted or transferred to any state which fails to comply with the decisions of the Supreme Court" outlawing segregation. This was carried with 225 Congressmen voting for it (148 Republicans and 77 Democrats) and 192 opposed (146 Democrats and 46 Republicans).

Some critics went even further condemning this strategy as a ruse resorted to by federal aid opponents to foil enactment of a government grants program.

Denying the Democrats were to blame for blocking needed school aid, Speaker of the House Sam Rayburn (D., Texas) stressed the final vote on passage of Congressman Kelley's $400,000,000 federal school construction bill (which at that time included the Powell anti-segregation amendment) was "the vote that really counted." On this the final line-up was, according to the *Congressional Record* for July 5, 1956, 194 members of Congress in favor of enactment (119 Democrats and 75 Republicans) and 224 against (105 Democrats, mostly from 11 Southern states, and 119 Republicans).

A further factor inclining toward stalemate in the opinion of this observer was that the influence generated in the concerted drives of pressure groups for or against federal aid tended to cancel each other out. The vigorous efforts of such national organizations as the National Education Association, Council of Chief State School Officers, CIO-AFL, and National Congress of Parents and Teachers to accomplish the legislation appeared counterbalanced by the well-organized opposition led by such national agencies as the American Legion, American Farm Bureau Federation, U. S. Chamber of Commerce, National Association of Manufacturers, and their local affiliates.

Importance of Leadership

The default of leadership on both sides of the aisle during the House debate last year was another obstacle to progress. The extent to which this lack will continue in the new Congress is one of the imponderables that could tip the scales toward passage of a federal school-aid bill or keep it bottled in Congressional cubbyholes.

When Congressman Graham A. Barden's fears (D., N.C.) that the school construction measure might become "a vehicle to ride in social legislation" were realized with the acceptance of the Powell Amendment and other changes last July, this lawmaker, who again is Chairman of the House Education Committee, stepped down as floor manager for the Kelley bill telling his colleagues: "So many bad features and so many things have been given priority over the consideration of the objective that we set out to accomplish that I must say, in all frankness, to the House I cannot continue in the position here of directing this bill. . . . I would have to be a much better actor than I now am to proceed in the position of handling this piece of legislation which I cannot support and do not want to pass."

And in the crucial hours of Congressional discussion no word came from President Einsenhower to rally the Administration forces behind the enactment of sound school construction legislation. If such a measure is to survive the cross fire generated by the Supreme Court's public school decision, it will take far stronger Presidential leadership than last time. A great deal hinges on the President's determination to push passage of school construction aid and personally persuade members of Congress to support a workable program.

Moreover, several of the key posts governing the movement of school aid legislation through the new Congress are again manned by Southern legislators, among them Representatives Graham A. Barden (D., N. C.), chairman of the House Education Committee; Howard W. Smith (D., Va.), head of the powerful House Rules Committee which ordinarily clears legislation for floor action; Speaker of the House Sam Rayburn (D., Texas) as well as Lyndon Johnson (D., Texas), the majority leader in the Senate and Senator Lister Hill (D., Ala.), who continues as chairman of the Senate Committee on Labor and Public Welfare.

Favorable Factors

On the favorable side of the ledger is the upsurge in public interest in school improvement with the result that an unprecedented number of citizens are better informed about school problems and more actively concerned about meeting school needs.

Citizens support for federal assistance to help states and localities build needed classrooms as quickly as possible was evidenced at the White House Conference on education whose some 2000 delegates "broadly representative of the nation" endorsed such action by a ratio of more than two to one. Public sentiment was also instrumental in the inclusion of this question in the 1956 planks of both major political parties and in making federal financing of school construction a leading issue of the election campaign debated by candidates at national, state, and local levels.

A further encouraging sign may be found in the fact that two Congressional Subcommittees, other than those officially charged with responsibility for education, last year urged that Congress pass federal school-aid legislation.

Aid for Federally Impacted Areas

Some see a first step on the road to broader action in the circumstance that Congress, through its enactment of Public Law 815 in September, 1950, has accepted responsibility for furnishing federal assistance for school construction to areas where the concentration of defense and other federal activities has caused a special need.

Under this program a federal contribution is appropriated to help provide classrooms for children who reside on tax-exempt federal property, or whose parents are employed on such property, by offsetting the resultant loss of local tax income that would otherwise have been available for building school facilities.

Since the start of this activity over six years ago, Congress has appropriated a total of $727,400,000, including $108,500,000 for the fiscal year 1957, to erect school houses in federally-impacted areas. When local funds are added to this figure, Rall I. Grigsby, director of the U. S. Office of Education's Division of School Assistance in Federally Affected Areas, estimates that approximately $1 billion worth of new construction will have been undertaken. The some 39,000 classrooms to be built with these funds will provide school housing for about 1,100,000 pupils.

THE AMERICAN
School Board Journal

An Independent Periodical of School Administration
William C. Bruce, *Editor*

SCHOOLHOUSE BUILDING IN 1957

THE school plant situation in the United States in this first month of 1957 is the most serious and confusing since the early depression years. The numbers of children registered for the first time is the greatest in the history of the schools and the growth of junior and senior high schools indicates that the serious shortages of classroom facilities will henceforth be in the upper four or six grades. What makes the situation difficult is the rising cost of bond interest due to federal policies, the continued shortages of certain building materials, and the further rise in labor costs — all of which have placed the construction cost index at a fantastic high of 644. School boards and their executives have ahead of them a complication of problems that will require true administrative wisdom and energetic attack on planning, financing, and public relations programs. The most encouraging event since the failure of the Kelly Bill is the repeated promise of President Eisenhower to push the bill for federal school construction aid to early passage in Congress.

In its preliminary estimates of school enrollment the U. S. Office of Education found 32,653,000 enrolled in the elementary and secondary schools in September, 1956. The estimates of the National Education Association were very close to these same figures, and both agencies agreed that the enrollment in 1957 would exceed 1956 by at least 1,197,000 in public elementary and secondary schools. The NEA predicted a needed increase of 55,000 in the instructional staff.

The increases in enrollments will require 120,000 new classrooms to replace obsolete buildings and to supply new rooms in freshly settled areas. According to the NEA we must build 328 classrooms each day in 1957. The slowness in construction will commit 840,000 children to attend half-day or part-time sessions and will thus deprive them of full-time schooling.

If the predictions of the U. S. Department of Labor are correct, the 1957 expenditures for school building construction will exceed those of 1956 which amounted to $2,500 million, by more than 11 per cent or will reach $2,900 million. This expenditure will hardly be sufficient to supply 120,000 additional classrooms. In fact, the funds needed should exceed $3,000 million to provide buildings which will be adequate for a balanced program of education. The raising of the amounts needed for the 1957 school construction program will require, as suggested above, the most vigorous and wise administrative promotion and direction. If the federal fiscal policies do not cause further rise in the present interest rates, it should be possible for school districts, whose credit rating has been guarded, readily to obtain all the moneys needed at 2.90 to 3.35 per cent. The year 1956 has not witnessed a state legislative progress toward the solution of the fiscal problems of poorer school districts. There is still a growing need for state subsidies, similar to the Florida law, which provides annual aid according to need. The bright hope in this whole confused situation is the promise of federal aid balanced according to state and local needs and to corresponding insufficiency of state and local taxing ability.

The one-story school has been a boon to elementary education, but the application of the one-story idea to schools enrolling more than 600 children deserves to be restudied. Buildings of more than 16 classrooms are wasteful of the time of children and teachers; they tax the strength of administrative and maintenance personnel. It requires courage for a school board to question the validity of one-story buildings when neighboring towns are erecting schools of this type.

The campus type of high school plant, while not practical for small schools, provides possibilities for expanding the secondary school program not yet realized in many communities. If, as is necessary, the high schools are to meet the needs of all children and provide parallel courses for children whose ability varies from the highly gifted, bookish youngsters to those barely able to carry a minimum schedule of studies, not merely the curriculum and the staff, and the teaching methods, but also the school plant must be arranged to contribute to the education of these individual children in their widely varying groups. In effect, the high school will be three, or even four, schools within the larger framework of the whole campus-served institution. The campus plant will then follow in simpler form the plan of the university which has half a dozen schools within its campus.

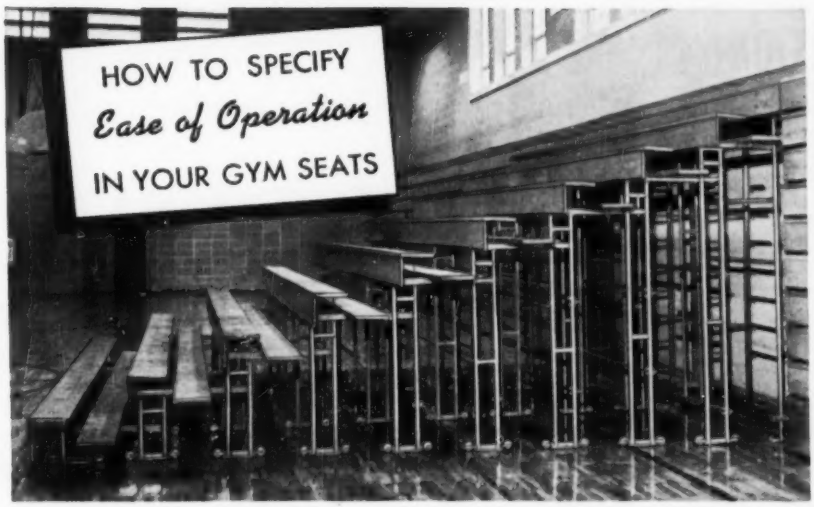
Perhaps the most promiseful development in contemporary design of school buildings is the application of color, made possible through the use of new ceramic and metallic plates and tiles, as dadoes and even entire walls. Interesting effects in red, blues, and tans, in harmonizing combinations are possible to offset the monotonous repetition of windows set in metal sash and the even more disappointing blind areas of glass block windows. Careful use of color has been made to emphasize entrances and other central features without the expense of cut stone or terra cotta ornament. Our architects should learn to make the blank walls of schools interesting and significant with mosaic designs or over-all friezes as have some of the European and Latin-American countries.

The present difficulties suggest the serious need of restudying new building plans from the standpoint of educational efficiency and ultimate economy. The vast new needs cannot be met unless the experience of administrators, school boards, and architects is reasserted in the form of leadership that will overshadow the present tendency to listen too closely to idealistic demands of men removed one or two steps from the responsibility held by the school boards and their professional executives.

THE NEW COMMISSIONER

THE new Commissioner of Education is Supt. Lawrence G. Derthick, who comes to Washington after a distinguished career in Nashville and Chattanooga, Tenn. Dr. Derthick has done outstanding work as a leader in the American Association of School Administrators.

During the past two decades the Office of Education has changed in the services rendered. It would be interesting to learn what administrative and advisory developments the Office can provide if it is under the leadership of a man who feels convinced that the Office can render consultation, advisory, and administrative services through personal and staff contacts. The growing expenditures of the government for state and local school purposes are improving the opportunities of the Commissioner to serve as executive and to recapture for the Office the services which have been slipping into other agencies.



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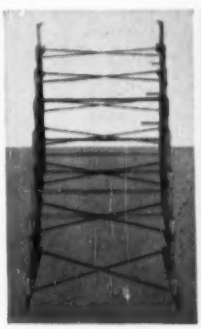

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A-V EDUCATION IS HERE TO STAY

. . . so let's not fight it by restrictive planning of basic classroom areas in our new school buildings

A. J. FOY CROSS
Professor of Education, New York University

While there are other indices of functional obsolescence in a school building, a school plant in 1956 is to a degree obsolete if it isn't properly equipped for efficient day-by-day use of audio-visual materials of all types in every classroom. This criterion, while meeting with very little disagreement on the philosophical level, is very often completely neglected in the preparation of new building design and in the specification of old school plant rehabilitation.

Few of us deny, for example, the important values of projected pictures in the instructional programs of our schools today. Yet every day of the year school planning committees are approving the expenditure of millions of schoolbuilding dollars for new classrooms in which projected pictures cannot be used effectively for instructional purposes. Furthermore, experience has shown, within a very short time after their construction, additional and relatively high costs may have to be paid to adapt these same rooms for use of motion pictures, opaque projectors, and other visual instruction equipment.

Audio-visual ways of teaching and learning are here to stay and it is an expensive oversight to neglect this fact in the planning of new school plants. Audio-visual techniques are but a part of an ever increasing body of knowledge about how people learn and about how teachers can assist pupils to do a better quality job of learning in school. School plants in which adequate provision for audio-visual instruction has not been made are not likely to be suitable to other improved instructional procedures of today and tomorrow.

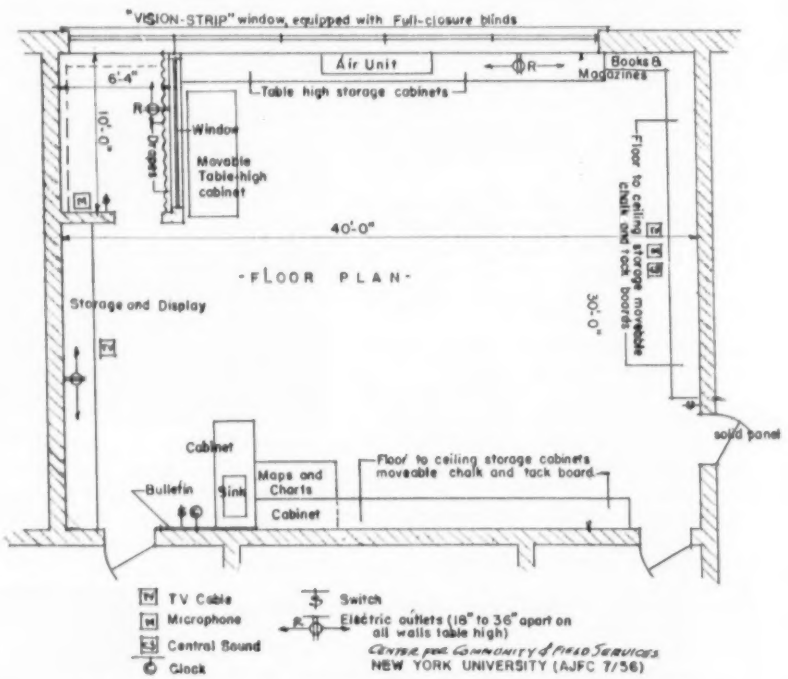
A-V Demands

What are the demands which modern audio-visual instruction makes of schoolhouse planners? As a matter of fact, the specifications of a room which is well adapted to audio-visual techniques would not vary a great deal from those of any modern thoroughly adaptable classroom. Let us see what a good high school classroom for today (and for the next 50 years) might be.

Class Space. For high school audio-visual-centered activities, as well as for other modern instructional procedures, each classroom should have approximately 1200 square feet of adaptable classroom floor space. This means, for common maximum class sizes, an average of 40 square feet per pupil for his chair, his desk, his chalkboard work, his reference shelf work, his part of "group work" in the classroom, and all his other possible activities. It means his share of space for one or more of several types of picture projection, and the space required for efficient and healthful viewing of projected pictures. It means his share of room space for a record player, a tape recorder, a radio, a television set, a slide viewer, a globe, an exhibit, and possibly other equipment. It means his share of space for classroom dramatizations, oral reporting, guest speakers, and other such activities. It means space for him to study or listen without the distraction of others in too close proximity.

No classroom, it is believed, should be a small classroom. Certainly, small rooms are not adaptable to good use of projected pictures with class groups of any size. Smaller sections of classes may use maximum rooms with efficiency but large groups cannot similarly make good use of rela-

(Continued on page 69)



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A-V EDUCATION

(Continued from page 66)

tively small spaces. In this connection, it is poor planning to construct a building to fit only the present-day curriculum and class schedule. No present-day demands should be permitted to determine through room size or arrangement the curriculum or schedule of the future.

Auxiliary Space. Approximately 100 square feet of space immediately adjacent to the classroom should be set aside as the professional "office," and counseling room of the teacher. Elementary and high school teachers are virtually the only professional people for which professional office space is not commonly provided. This space should be so partitioned off from the classroom that within it pupil-teacher, or parent-pupil-teacher conferences may be conducted in relative privacy. In addition to providing a place for study, record keeping, and consultation, this space should make it possible for teachers to review all types of instructional materials in preparation for their use in the classroom. The usefulness of this teacher's space increases with the increased responsibility of the teacher for teacher-pupil relationships above and beyond assignment, lecture, recitation levels.

In addition to the teacher's office and counseling room, a space should be provided for those creative activities of small groups of students which might be distracting to the total class or which might require construction work and storage from day to day until completion. This is a place where many of the class-made audio-visual materials are prepared. This area if jointly used by two adjoining classrooms should occupy approximately 150–200 square feet of floor space.

Classroom Storage Space. As the curriculum moved beyond the single text for each subject it became increasingly important that each classroom had storage for various kinds and amounts of instructional materials. The modern classroom which is, or in all likelihood will be, used for larger-time block classes where students do serious study as well as "recitation" and many other learning activities, it is essential that a great deal of storage space be provided within the classroom. This space should accommodate maps, charts, pictures, specimens, and other materials as well as reference books, auxiliary texts, etc.

Light and Light Control. Audio-visual instruction has focused much attention on the problem of classroom lighting and upon the relationship of light and light control to eye tasks to be accomplished in the classroom. When projected pictures first came upon the school scene as a part of the school instruction program, teachers who made use of them had to move their classes to specially "darkened" rooms, sometimes in remote areas of the building or in the basement.

This practice did not bring on much conflict between light in the classroom and special light control for projected pictures. The use of projected materials in the audio-visual program grew so rapidly, however, that special darkrooms could no longer meet the demand. At the same time it was discovered that even if a school could provide enough "darkrooms" for all teachers to use such rooms as often as they wished without waiting for a scheduled use there were several decided disadvantages to taking a class out to one of these "darkrooms." Much of the learning value of the projected pictures was lost by the distraction and loss of continuity of study when even a short "break" was necessary between the class routine and the seeing of the picture in a different room.

This is where the teacher with his audio-visual program entered the growing controversy on classroom lighting. School building architects and planning committees and teachers alike were demanding good, shadow-free, and glare-free light in the classroom. But the modern teacher was demanding good light plus the degree of light control which will permit efficient use of projectors of all types. School planners frequently agree in principle with the teacher but point to the increased cost of meeting both demands.

The trend of more and more modern planners to satisfy both the good light demand and the need for more complete light control has been to provide for most of the ordinary classroom light demands by electrical sources and to supply only minimum window space for the comfort of being able to look out of a window. The light from such reduced window areas may be easily controlled by relatively inexpensive installations of full-closure venetian blinds, and/or decorative classroom drape materials.

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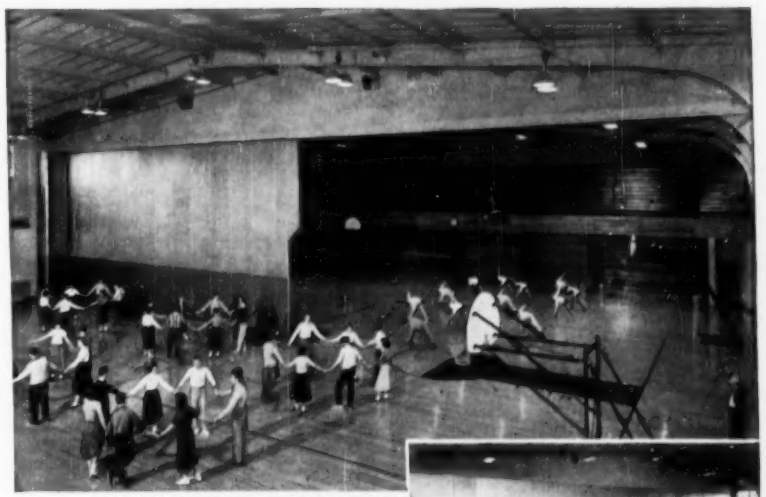

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Such de-emphasis of window areas in favor of natural lighting schemes also leads to more efficient use of classroom space. Not only does instruction become more nearly 360°-oriented, but, to a degree at least, the fourth wall becomes an "instructional wall."

Ventilation. Poor ventilation and improper room temperatures create uncomfortable, and in some instances, unhealthy classrooms. And discomfort alone has long been known to be a serious distraction factor in learning situations. In the use of projected-picture in the classroom, this distraction factor sometimes becomes acute where ventilation and temperature controls are disturbed by closing off windows and doors.

For the modern building with the extremely wide range of activities taking place at any time of the day, including showing motion pictures in some rooms and possibly singing or square dancing in others, it is quite unlikely that proper control of ventilation and temperature can be achieved without provision for individual classroom unit control.

Sound. The audio part of the audio-visual program has pointed up the need for attention to the importance of sound "treating" all classrooms and other instructional areas. Sound motion pictures, or recordings, or radio broadcasts, or television programs are likely to show up at any time in any room in the building as a regular part of the classwork. For the good use of such equipment within a classroom and to avoid undue distraction by such devices of students in other rooms, all classroom and laboratory areas should be carefully treated to reduce reverberation within the room and to reduce sound transmission from one room to another.

Wiring. It would be difficult to anticipate just what the wiring requirements of our classrooms will be even a couple of years in the future. It is safe to say that there will undoubtedly be an increase in the number of commonly used machines and instructional or learning-aid devices even within that short period. Even in the present stage of development of the audio-visual part of a school it has become evident that there must be provision for electrical outlets in all areas of the classroom.

Also with wide use by schools of both broadcast and closed-circuit television just around the corner, no new building should be erected without ample wiring for classroom television equipment.

Summary

In short, for good use of audio-visual materials as well as for early adaptation to other desirable instructional practices the classroom for today and for the foreseeable tomorrow should ideally have:

1. Approximately 1200 square feet of adaptable floor space in classroom proper, plus.
2. Approximately 100 square feet of space for teacher office-study-counseling room, plus.
3. Approximately 100 square feet of workroom space for student group work projects.
4. Storage space for wide variety of instructional materials including books, charts, flat pictures, posters, etc.
5. 50–70 foot-candles of shadow-free, glare-free light available at all times in all working areas.
6. Light controls which will reduce room light for effective use of projected pictures.
7. Adequate air and comfortable temperature locally and automatically controlled, and free from noise and drafts.
8. Structure and acoustic treatment which screens out distracting outside noise and reduces reverberation of sound from within the room.
9. Adequate wiring and conduits to provide for use of modern classroom equipment.
10. Hot and cold running water.
11. Appropriate equipment for use of projected materials, radio, television, recording and "playback" equipment, files, display areas, and flexible classroom furniture.

TV STUDY

TV lessons have been found useful in language classes in New York City. James Macandrew, director of broadcasting for the board of education, has declared the modern language class in secondary education is the most exciting spot in school today. He said if the teacher can be assisted in the work by television, we owe it to education to give her every advantage. Mr. Macandrew described a two-way audio instruction program, carried out in Levittown, where an instructor in the room receiving the TV show has power to inform the broadcaster that one of his students has a question. TV's outstanding contribution to education is to put the American teacher in the home, according to E. A. Hungerford, of the Metropolitan Educational Television Association.

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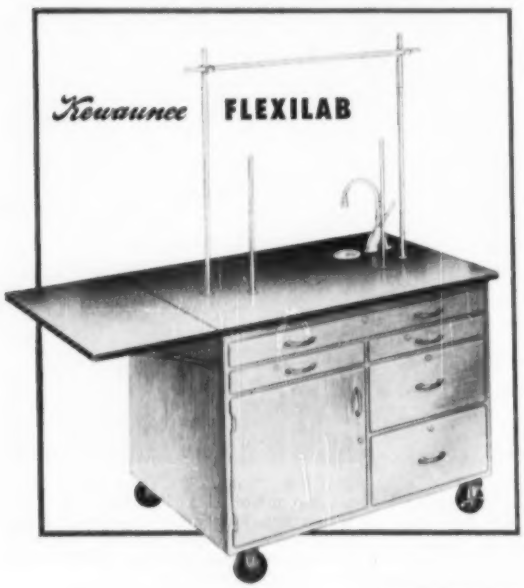

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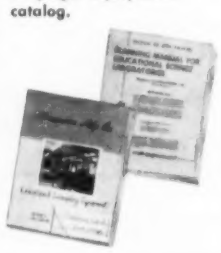

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ADMINISTRATION NEWS

INTERN POSITIONS

In Pontiac, Mich., administrative intern positions have been created to insure the development of good administrative leadership. Four teachers, selected from the staff last year, have been assigned full time this year to the administrative internship program, which is designed to insure familiarity with the system and to offer experience in the leadership role. At the end of the current school year, the trained interns will be eligible for administrative positions.

In addition, two helping teachers have been assigned to work with a group of 25 teachers. These instructors, who are master teachers drawn from the school system, are expected to help new teachers get off to a good start in September. The work now in its second year, has proved most successful.

During the past three years an elementary library service plan has been in operation, with five full-time librarians serving 22 schools. The budgets have been increased to $1 per pupil per year, to provide library materials, and $2 per year where the materials are inadequate. The library is being used as an important part of the instructional program.

SCHOOL ADMINISTRATION

★ The school board of Lansing, Mich., has announced several additions to the school administrative staff for the 1956–57 school year. Four new directors have been named and a fifth is contemplated. The new directors include one for music education, one for elementary education, one for secondary education, a director of special services, including public relations, community relations, etc.

★ A school reorganization program is being conducted in Sterling, Mich. The purpose is to consolidate two Class C school districts and 28 rural districts into one kindergarten through twelve school districts. The work was conducted under the direction of Eugene N. Spencer, superintendent of schools.

★ Romeo D. Brion, of Manila, P. I., has been employed by the school district of Inkster, Mich., as administrative intern while working toward a doctor's in school business management at Wayne University.

★ Sharpsville, Pa. The school board has proposed a change in the status of the cafeteria employees, making them eligible for social security benefits. It was explained that some employees who are close to retirement would benefit more under social security than under the state retirement plan.

★ Oak Grove, Mo. The school board has approved a proposed achievement testing program for 1956–57. The subject matter area for the tests includes reading, mathematics, social studies, spelling, science, language, and study skills.

★ Seattle, Wash. The school board in voting to close the school year on June 7, has reduced the number of pupil attendance days from 181½ to 180. It will be necessary to devise a plan to make up the days lost.

★ Lancaster, Pa. The Lancaster county board has established a day care center for mentally retarded children. Eleven children, ranging in age from seven to thirteen, are in attendance.

★ Benzonia, Mich. A county-wide survey of school systems has been conducted in Benzonia, Mich., and the vicinity. The survey conducted by members of the staff and representatives of the State Department, included an appraisal of present school systems, an evaluation of future needs, and data on which to base recommendations for action this year. The survey complies with a request of the State Education Department that each county have a study to determine reorganization and consolidation procedures to be undertaken within a two-year period.

A five-period day has been established in the high school, which provides 65-minute periods, and eliminates the need for study halls.

★ Bangor, Mich. The superintendents of Van Buren and Allegan counties have compiled data and information concerning the high school districts of the two counties. The information to be presented to the state legislature, shows the enrollments, financial needs, building needs and prospective enrollments, which will be used as a guide in preparing legislative measures.

★ The school board at Manton, Mich., has adopted a new school policy which provides that no student may be turned over to a principal for disciplinary action, unless it is serious enough to call for a meeting of parents, teacher, and school administration. No student interviews will be permitted unless a member of the school staff is present.

★ Hazelton, Pa. The Butler township school board has ruled that students who become unruly, boisterous, or malicious on school buses shall be denied transportation. The parents or guardians must supply the transportation or the student may be expelled. Bus drivers are authorized to remove such students from the buses.

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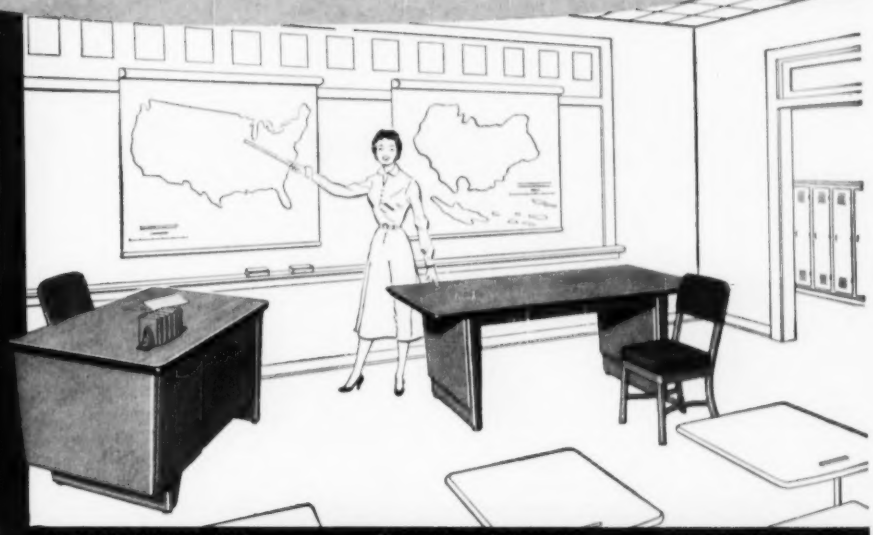

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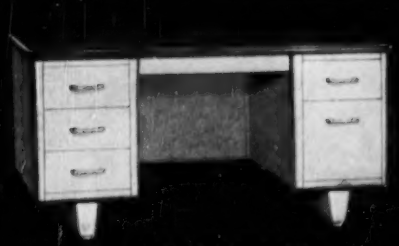

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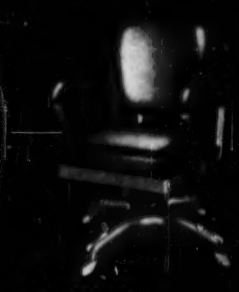

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Designs for Today's School Lunchroom

Contemporary trends in the design of the school lunchroom reveal the influence of modern thought regarding the purposes of the school cafeteria and the influence of strained school-building budgets.

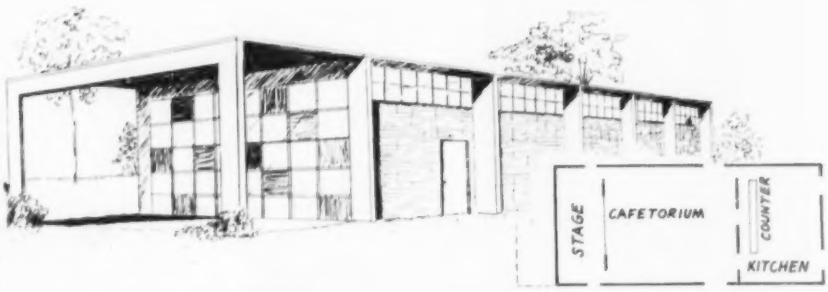
The first function, that of the expanded role the school cafeteria plays in educational processes, has created a tendency to use each classroom as a lunchroom and to do away with the special cafeteria. A central kitchen prepares the meals for many, if not all, of the schools in a district. Trucks with portable serving units carry them to the individual buildings where the children pick up the lunches in "hot sacks" and return to their classrooms to eat. While this "hot sack lunch" offers advantages in the area of initial economy and reduced maintenance cost, the most mentioned asset of classroom service is the ability of the teacher, who has her lunch with the children, to closely observe eating habits and to talk about food and good manners. Order and improved discipline are other by-products of this form of a school lunch program.

The influence of economy in planning the school lunchroom has brought about the physical combination of a cafeteria with the gymnasium and/or the auditorium and/or the oversized classroom. This multi-purpose room serves the function of a cafeteria during the lunch period, and one or another of the above functions during the remainder of the school day. Community activities, such as P.T.A. meetings, are also served well by this multi-purpose room.

An interesting innovation in the design of this multi-purpose room has been achieved in the Southside elementary school in Angleton, Tex. This 12-classroom building has a 36-foot hallway between eight of the rooms. A stage occupies one end of the "corridor" and a cafeteria kitchen the other. This multi-purpose room, therefore, serves triple duty in being a corridor for the students during the day, a lunchroom at noon, and an auditorium for assemblies, dramatic productions, and community activities. Architect of the school was Emory S. White of Houston, Tex.; Charles M. Kelso is superintendent of the Angleton, Tex., independent school district.

Manifested in secondary plants especially has been the trend of separating the academic and auxiliary areas from the

(Concluded on page 76)



Squaw Peak Cafetorium

Westwood High School

Southside Elementary School

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SCHOOL LUNCH

(Concluded from page 74)

cafeteria or by making the lunchroom a separate building.

The first direction was incorporated into an entirely glazed, circular cafeteria in the Westwood, Mass., high school. The architects, Coletti Brothers of Boston, Mass., believe "The form in itself gives exhilarating pleasure, and the continuous expanse of glass bathes the interior with an abundance of pleasant daylight. One is hardly conscious of the separation between exterior and interior, and lunch is a far cry from the experience of gulping a sandwich in some corner . . . or some connected interior auditorium of yesterday."

In the campus type school has developed the cafeteria as a separate building. An example of this is the novel, fluted-roofed cafeteria of the Kirksville, Mo., high school, designed by architects Hellmuth, Obata & Kassabaum of St. Louis, Mo.

An economically-directed refinement of the above trend is the combined cafeteria-auditorium: the school cafetorium.

The Squaw Peak elementary school multi-purpose building designed for the Creighton school district of Phoenix, Ariz., is an example of this trend. The building was designed to serve efficiently "as a cafeteria for 350 children, as a school auditorium, and as a pleasant and convenient meeting place for local community gatherings and activities." Mel C. Ensign was the architect; Edwon L. Riggs is superintendent of the district.

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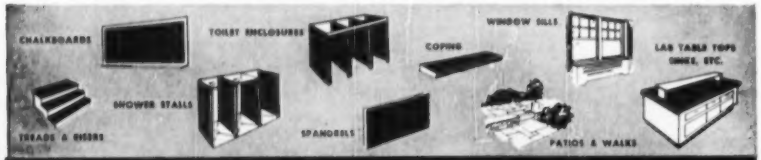

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SCHOOL BOARD NEWS

★ The school board of Manton, Mich., has completed the preparation of a statement of school board policies, developed with the co-operation of parents, teachers, and board members.

★ A committee of citizens, school employees, and board members in Hamtramck, Mich., has recently completed the codification of the school board policies. The policies were adopted by the board in October, 1956.

★ The school board of Oak Park Dist., Oak Park, Mich., has distributed a printed newsletter to school patrons and the citizens explaining its new educational policies and programs. The newsletter has been an effective way of communicating with new and old residents of the community.

★ Los Angeles, Calif. School employees have voted to join the state employees retirement system. They will join with teachers in an election on the question of disbanding the present local retirement system in Los Angeles schools. Nearly 30,000 teachers and nonteaching employees are affected.

★ Dubuque, Iowa. Seven local civic and social organizations have received the permission of the board for use of public school facilities.

★ St. Louis, Mo. Inkwells are on the way out, according to Supt. Philip J. Hickey. Ballpoint pens will be in use beginning with February 1, to eliminate such accidents as when a penpoint is pushed into a child's hand.

★ The board of education of the East Richland, Ill., unit district has established a uniform safety patrol for the schools. A plan and a schedule of orientation for members has been set up. School patrols receive their instructions from a special safety committee.

★ The Brookfield, Mo., school board has increased the insurance on school property by $80,000. The insurance carried is 80 per cent of the appraised valuation of the property.

★ The school board of the Lehighton-Weissport Union Dist., Lehighton, Pa., has appointed a five-member citizens' committee to co-operate with it in planning a new high school.

★ Milton, Pa. The Milton area joint school board has adopted the United Community Fund plan and has banned all other money-raising campaigns in the schools. Last year more than a half dozen fund campaigns were conducted among pupils.

★ Anchorage, Ky. The voters have approved a special general purpose 50-cent school-tax increase, which increases the school tax bill to $2 for each $100 of property valuation.

★ Groton, Conn. The annual meeting has cut Supt. Lewis G. Allbee's salary by $100,000, but Mr. Allbee was undisturbed. The board was compelled to correct an error in the report which listed the salary at $110,000.

★ The Fairfax County, Va., school board has voted to place a limited amount of school expenditures, formerly financed under school construction bonds, on a pay-as-you-go basis. The board has agreed to provide in the budget for the payment of library desks, stadium seats, band instruments, and classroom desks. It is believed the board will effect a saving under the program.

★ East Peoria, Ill. The school board has effected certain changes in the purchasing methods of the school cafeteria. It was ruled that all items of food purchases shall be itemized before presentation to the board for payment.

★ The school board of Marine City, Mich., has approved a 79-page written statement of school board policies for the use of the local school system. The statement was prepared following a two-year study.

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BUILDING NEWS

LOS ANGELES SCHOOL PLANNING

The Los Angeles public schools, which opened for the school year 1957 with five new schools and many new additions, are still faced with large classes and a shortage of school facilities. It is estimated that 16,000 elementary pupils will be on half-day sessions and 13,000 junior and senior high school students on short sessions.

During the school year 1955–56, a total of 939 new classrooms were constructed by the Schoolhouse Planning Division. These were soon taken up by an influx of 20,000 new students.

It is anticipated that the 372 elementary schools will enroll 280,00 students; the 46 junior high, 83,000; and the 42 senior high, 82,000.

NEW DIVISION

The board of education of Kalamazoo, Mich., has Supt. Loy Norrix to establish a new division, to be known as the Department of Plant Engineering, and to comprise three administrative assistants, one to serve the superintendent, one an assistant superintendent, and a third to be known as the director of plant engineering. The division has become necessary because of the problems concerned with a rapidly expanding school district and the construction of numerous new school buildings.

A LIGHTING CODE

The state of Wisconsin is in the process of revising its lighting code as applied to schools. The new regulations provide that all classrooms, study halls, laboratories, libraries, general areas of shops and offices be equipped with artificial lighting to maintain a minimum intensity at the work level of 30 foot-candles; in sight saving classrooms, drafting rooms, typing rooms, and sewing rooms the intensity is to be 50 foot-candles; in the reception areas, gymnasiums, and natatoriums the intensity is 20 foot-candles; in auditoriums, cafeterias, locker rooms, washrooms, corridors, containing lockers and stairways the intensity is 10 foot-candles. An allowance of at least 30 per cent should be made for depreciation from dust and other causes.

Exits, stairways, and corridors are to be provided with lighting independent of other rooms. This lighting is to be of the emergency type.

The new regulations will require in classrooms a minimum vision strip 3 feet wide and not less than two thirds the length of the wall containing windows. Brightness control must be provided for natural light.

The new code is intended to provide optimum visual brightness differences by eliminating excessively high brightness areas and by increasing the brightness of dark areas within the total visual environment.

NEW BUILDING PROGRAM

Providing the necessary number of adequate elementary classrooms has long been a problem in Glen Rock, N. J. During the school year 1955–56 a new high school has been erected, and efforts are now being directed to the construction of 24 new elementary classrooms. It is planned to use rooms in the senior high school by junior high school students until needed by senior high school students. This enables the continued use of the Hamilton School for elementary purposes until September, 1958. The educational planning for this program has been carried out by Eugene Bradford, superintendent of schools.

DEDICATE HIGH SCHOOL

The board of education of Blue Springs, Mo., recently dedicated a new high school, costing $600,000. The building which accommodates 350 students, comprises three divisions, a one-story administrative unit, a gymnasium-cafeteria wing, and a two-story academic wing. Shaughnessy, Bower, and Grimaldi were the architects.

SURVEY THE DISTRICT

★ The school board of Wayzata, Minn., has begun a survey of the school district for the purpose of redefining basic purposes and evaluating the effectiveness of the educational system. The board has prepared and issued a brief questionnaire which is being distributed to the parents of children who are in the schools now or will be in the near future.

The board has also conducted a study of the educational philosophy and curriculum with a view to making a number of administrative changes and a revision of the school curriculum. The latter includes new credits in the college preparatory course, more choice in electives, a new language course at the eighth grade level, in-service training of teachers with special training in art, music, physical education, and health; more emphasis on lesson plans, and additional stress on evaluation. A new marking system has been adopted, providing reports to parents, horizontal marking with vertical notations, and vertical marking with horizontal notations.

GIVE DIPHTHERIA SHOTS

Sixteen immunization teams have inoculated 50,000 children in Detroit, Mich., in an emergency campaign to stop an outbreak of diphtheria. The outbreak was confined to the city's lower west side, where the victims were largely children.

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NEW BOOKS

Architects' Manual for Junior and Senior High Schools

Roslyn Public Schools, Roslyn, L.I., N. Y.

This manual, a co-operative project, involving the combined efforts of administrators, teachers, board members, and citizens, is addressed to the architects who have been entrusted with the job of planning a complete new junior high school for grades seven and eight, and a major addition for the expansion of the senior high school, including grades nine to twelve. The manual is in reality an educational program, including the specific data on the classrooms and other instructional areas, the service rooms, and the traffic areas of the two buildings. The manual includes in separate parts, complete outlines and information: (1) the Roslyn community and its schools; (2) complete recommendations for the junior high school, including data concerning the activities and the equipment of each room; (3) recommendations for the new rooms in the senior high school addition, and the remodeling of present rooms to meet the new purposes. The study is a model of completeness, a type of tool which every architect needs, but which very few receive.

Buildings for Today and Tomorrow

Paper, 23 pp. Published by the board of education, Detroit, Mich.

This 1956 annual report of the superintendent to the Detroit board of education, summarizes the very effective results of the past seven years of work devoted to the physical school plant and its expansion since 1949. It lists 32 new elementary schools and 62 additions, three high schools, additions to two junior high schools, one special school and additions to two, an addition to a trade school, and 23 new transportable buildings. It is expected that the steadily mounting enrollment will continue through 1963 and that there will be a need for more teachers and other employees.

School Building Requirements in Angleton, Texas

Compiled by Wallace H. Strevell. Paper, 64 pp. Published by the College of Education, University of Houston, Houston, Texas.

This bulletin reports facts found in an extensive study of school building needs in Angleton, carried on by the department of administration, University of Houston. The school district occupies one fifth of Brazoria County, has a population of 9000, and a school enrollment of 2300 pupils. The region is largely agricultural, and has important oil and natural resources. The school population has increased yearly until in 1955-56 it reached 2195 pupils.

The school plant consists of a Central elementary school, a junior high school, a senior high school, and two outlying elementary schools, all on adequate sites. The enrollment trend is outstripping classroom capacities. It is suggested that a new senior high school be erected for 600 students, that the Marshall School be replaced by a modern structure of six classrooms and cafeteria, that the new Central School be improved, and an old building discontinued. A new classroom wing is suggested for the Northside elementary school, and a modernization program for the junior high school. Renovation, modernization, and improvement of other sections of the plant are indicated.

Color in School Buildings

Paper, 50 pp., 85 cents. His Majesty's Stationary Office. Available in the United States from the British Information Service, New York, N. Y.

This is a second edition of a very useful bulletin of the British Ministry of Education for the use of local school authorities in decorating new school buildings and redecorating old ones. There are strong similarities to American practice. The book has a fresh, practical approach that takes into account economy and both the artistic and instructional efficiencies needed in classrooms. We need a similarly down-to-earth bulletin for use by boards of education and their officials in small towns.

A Directory of 16mm. Film Libraries

By Seerley Reid and Anita Carpenter. Paper, 198 pp., 70 cents. Bulletin No. 12, 1956. U. S. Department of Health, Education, and Welfare, Washington 25, D. C.

Compiled for the use of teachers, school administrators, and librarians.

(Continued on page 82)

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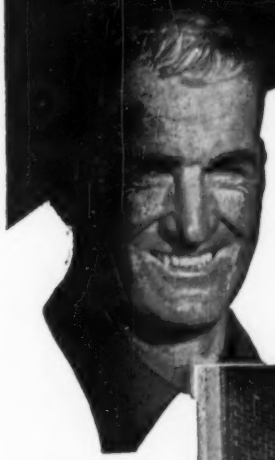

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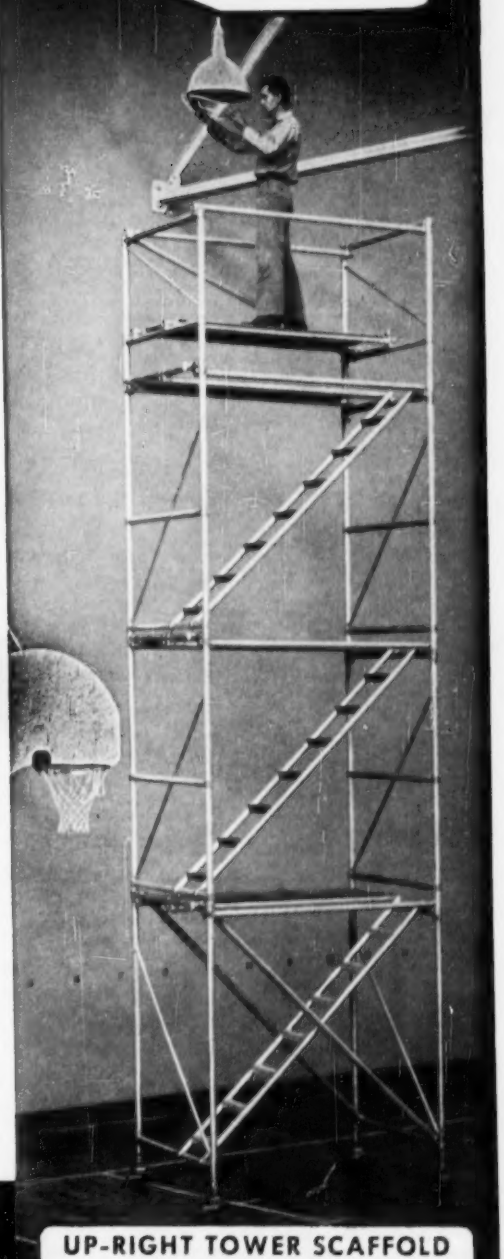

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Identical to Chalkrobe but with pin-up cork board instead of "Chalkboard". These units permit complete flexibility in use of floor space. Can be anchored to floor, or wheeled about on casters. Hold wraps out of the way in orderly and efficient manner.

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With closure panels (as original equipment or add-on units) Chalkrobe and Corkrobe units serve as flexible room dividers, movable walls or screens. Widely used to enclose temporary class rooms, to "build" cloak rooms, meeting rooms, etc.

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Matching units for Wallmount. Keep overshoes off-the-floor in an orderly manner.

Write for "Schoolline" Catalog SL-206

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(Continued from page 80)

Study of Public School Building Needs in Columbus, Ohio

By M. J. Conrad, Francis T. Rudy, and Warren E. Beers. Paper, 83 pp. Bureau of Educational Research, College of Education, Ohio State University, Columbus, Ohio.

This, the third, detailed study of the Columbus school plant needs is impressive evidence that the growth, and the rapid changes in large city populations, makes restudies imperative. Annexations of new territory, shifts in population, changes in the educational program, and projected growth in enrollments, make an early outlay of $12,400,000 for new and remodeled buildings a real need.

School Salary-Schedule Provisions

Paper, 22 pp., 25 cents. Research Division, National Education Association, Washington 6, D. C.

This bulletin reports the minimum and maximum salaries of classroom teachers in 105 urban school districts over 100,000 population. Teachers are classified into four groups: lowest preparation, bachelor's degree, master's degree, and highest preparation above six years.

The Property Tax and School Finance

Paper, 23 pp., 10 cents. Illinois Association of School Boards, 223½ E. Washington St., Springfield, Ill.

In question-and-answer form, this joint study of property tax procedures and problems provides local school authorities with information about the chief sources of school funds in the state of Illinois.

Statistics of City School Systems: 1953–54

Chapter 3 of the Biennial Survey of Education. Compiled by Lester B. Herlihy. Paper, 153 pp., 60 cents. U. S. Department of Health, Education, and Welfare, Washington 25, D. C.

This report is limited in statistics to elementary and secondary school systems in cities of 2500 population and includes data on higher institutions of learning administered as a part of the city system. The report lists 3775 independent public school systems. These schools are taught by 555,400 teachers, of whom 25 per cent are men. The enrollment during the period 1951–52 rose by 10.4 per cent to 15,912,000, an increase of 1,498,000. The average teacher's salary paid was $4,190.

A Layman's Guide to School Construction

Paper, 26 pp., 50 cents. Public Expenditure Survey of Wisconsin, Madison 3, Wis.

This study of school plant planning and construction outlines for board of education members the fundamental problems of planning school building programs, of planning individual buildings to meet the local construction program, and of constructing buildings for ultimate economy.

Statistics of Higher Education

Paper, 142 pp., 45 cents. U. S. Department of Education, Health, and Welfare, Washington, D. C.

This survey of faculty, students, and degrees embraces the year 1953–54. It indicates that there were 268,000 faculty members, a rise of 9 per cent; 2,500,000 students, also a rise of 9 per cent.

Adult Education in Transition

By Burton R. Clark. Paper, 202 pp., $3. University of California Press, Berkeley 4, Calif.

A study of insecurity of California institutions.

Educational Television for Your Community

Paper, 24 pp. Educational Television and Radio Center, Ann Arbor, Mich.

This booklet argues the values of ETV and suggests ways of establishing and operating a local station.

The South American Handbook, 1956–57

Thirty-third edition. Cloth, 862 pp., $2.50. The H. W. Wilson Co., New York 52, N. Y.

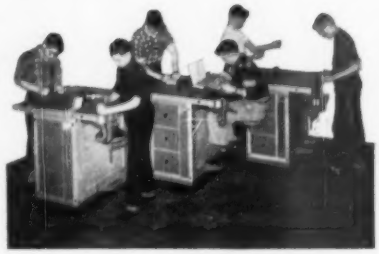
The thirty-third edition of a standard English work. It is addressed to businessmen as well as tourists.

The Teacher's Treasure Chest

Edited by Leo Deuel. Cloth, 372 pp., $5. Prentice-Hall, Inc., New York 11, N. Y.

This book of 60 and odd stories, essays, anecdotes, and poems presents a romantic and still realistic picture of those who teach and those who learn in American schools and colleges.

Sheldon



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"Your records... and how you can protect them" is a free offer booklet that can quickly assess the record protection your school requires. The need is now for fire-safe protection, and just to emphasize our point, we want you to have the factual story of Hillsboro High School and a fire that destroyed everything but the records. Of course, the records were housed in REMINGTON RAND insulated equipment.

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PERSONAL NEWS

CALIFORNIA

Los Angeles, **Dr. Louise W. Seyler** has been elected deputy superintendent.

DELAWARE

Maurice C. Bower is the new superintendent at Stirling.

ILLINOIS

Maurice P. Clark has taken the superintendency at Western Springs.

INDIANA

At North Posey District, **Eldon R. Crawford** is the new superintendent.

MICHIGAN

At St. Clair Shores, **Thomas C. Campbell** is the superintendent and **Murl Momany,** is assistant superintendent.

Stuart L. Openlander is the new superintendent at Dearborn.

K. Wayne Yaple is the new assistant superintendent at Plainwell.

At Hartland, **Edwin B. Olds** is the new superintendent.

Frank Hartman is the new superintendent of the Carmen District in Flint.

MINNESOTA

Dr. James V. Moon is the new superintendent at Rochester.

At Blue Earth, **A. Lowell Nelson** is the new superintendent.

NEBRASKA

LeRoy Pointer is the new superintendent of Big Springs.

Uhrichsville, **Samuel Shimp** has been elected superintendent.

NEW JERSEY

Anthony R. Catrambone is the new superintendent at Camden.

NEW MEXICO

Charles R. Spain, former president of New Mexico University, is the new superintendent of Albuquerque, replacing the late John Milne.

Roswell, **Homer F. Allred** has been elected superintendent.

OHIO

Harold S. Vincent, former superintendent at Milwaukee, Wis., is the new state superintendent.

OKLAHOMA

Murl Venard is the new superintendent at Gotebo.

PENNSYLVANIA

Arthur O. Horn is the new superintendent of McKeesport.

Berwick, **Elmer J. McKechnie** has been elected superintendent.

TEXAS

El Paso, **H. E. Charles** has been elected superintendent of schools for 1956–57.

PERSONAL NEWS SCHOOL BOARD OFFICIALS

ILLINOIS

Harlem, **Everett E. Magnuson** has been elected vice-president of the Illinois Association of School Boards.

INDIANA

Harold DeVault is the president of the board at Calumet Township.

IOWA

Mason City, **Mrs. L. William Swanson** has been elected president of the Iowa School Boards Association.

Spencer, **Dale Norton,** a member of the school board, died of automobile injuries.

OHIO

Fairport, **Grant Bittner,** president of the board, died on November 20.

KANSAS

The Topega board has appointed **Alan J. Stewart** director of public relations.

Dr. R. E. Bula is board president at Lyons.

MINNESOTA

Elected to the State Board of Education was **John W. Bystrom** of St. Paul.

MISSOURI

Kansas City, **Roland B. Hewitt** has been elected president of the school board.

NEW JERSEY

At Allendale, **George H. Wolfson** has been elected president.

PENNSYLVANIA

Donald Treon Sunbury has been elected president of the Pennsylvania State School Boards Association.

Elected president of the Wilson board was **Clark Felver.**

J. G. Houston is the president of the Pittsburgh board.

When you build –

DURACITE throughout at ALVERNO COLLEGE
Milwaukee, Wis. Architect: Maguolo & Quick

Remember *that the first Low Cost of* **DURACITE Chalkboard** *is the Last Cost*

● Because architects design school buildings to meet specific needs and exact appropriations . . . many outstanding school architects use DURACITE CHALKBOARD. It helps keep building costs down and *offers lifetime service as well.* Accurate laboratory tests that "speed up" the rigors of classroom wear prove DURACITE good for over a hundred years average classroom service! Surface and visibility actually improve with age.

There are no reservations as to how DURACITE should be used or cleaned. It is ready for hardest classroom use under all conditions, such as erasing, soap and water, detergents, alcohol, turpentine, kerosene, naptha or lacquer thinner . . . to remove stains from lipstick, hair oil, food spots, perspiration, glue, colored chalk, wax crayons, etc.

SEVEN PASTELS

Clearcite Green • Blue Black
Dark Myrtle Green • Blue Grey
Coral • Earth Brown • Powder Blue

The DURACITE surface is available with various types of backing panels and thicknesses, and in 7 pleasing, harmonizing colors.

No. 100—3 ply ½" hardboard long tongue and groove, close-fit joint.

No. 101—2 ply ½" hardboard with overlap close-fit joint.

No. 102—¼" dense treated hardboard and extruded aluminum divider strips.

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No. 109—"Asbestocite," as above, laminated to 3-ply wood backing—½" overall.

Also: Factory-built units, ready to hang.

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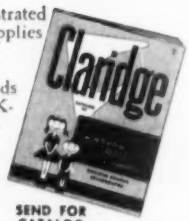

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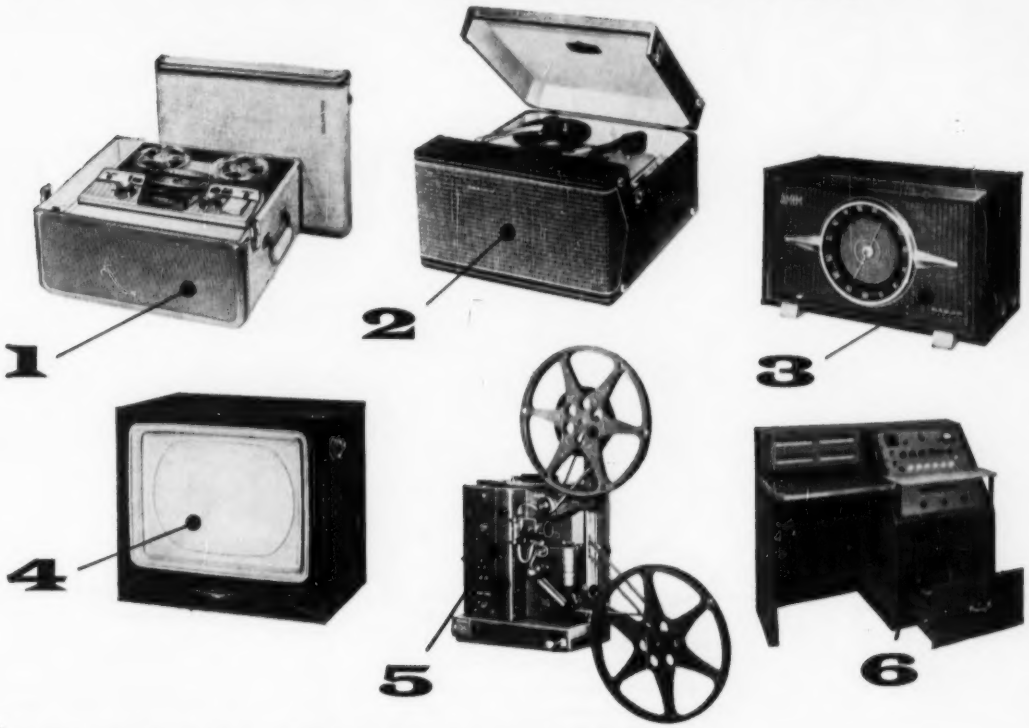

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5 Show educational 16mm films —sound or silent—and be sure the performance will be professional every time with the RCA 16mm Motion Picture Projectors. They're easy to thread, operate—give brilliant light and sound.

6 Distribute educational programs, and keep in touch with every classroom through an RCA central control sound system. Portable systems, too, for the widest variety of indoor and outdoor situations. Also a complete line of RCA components.

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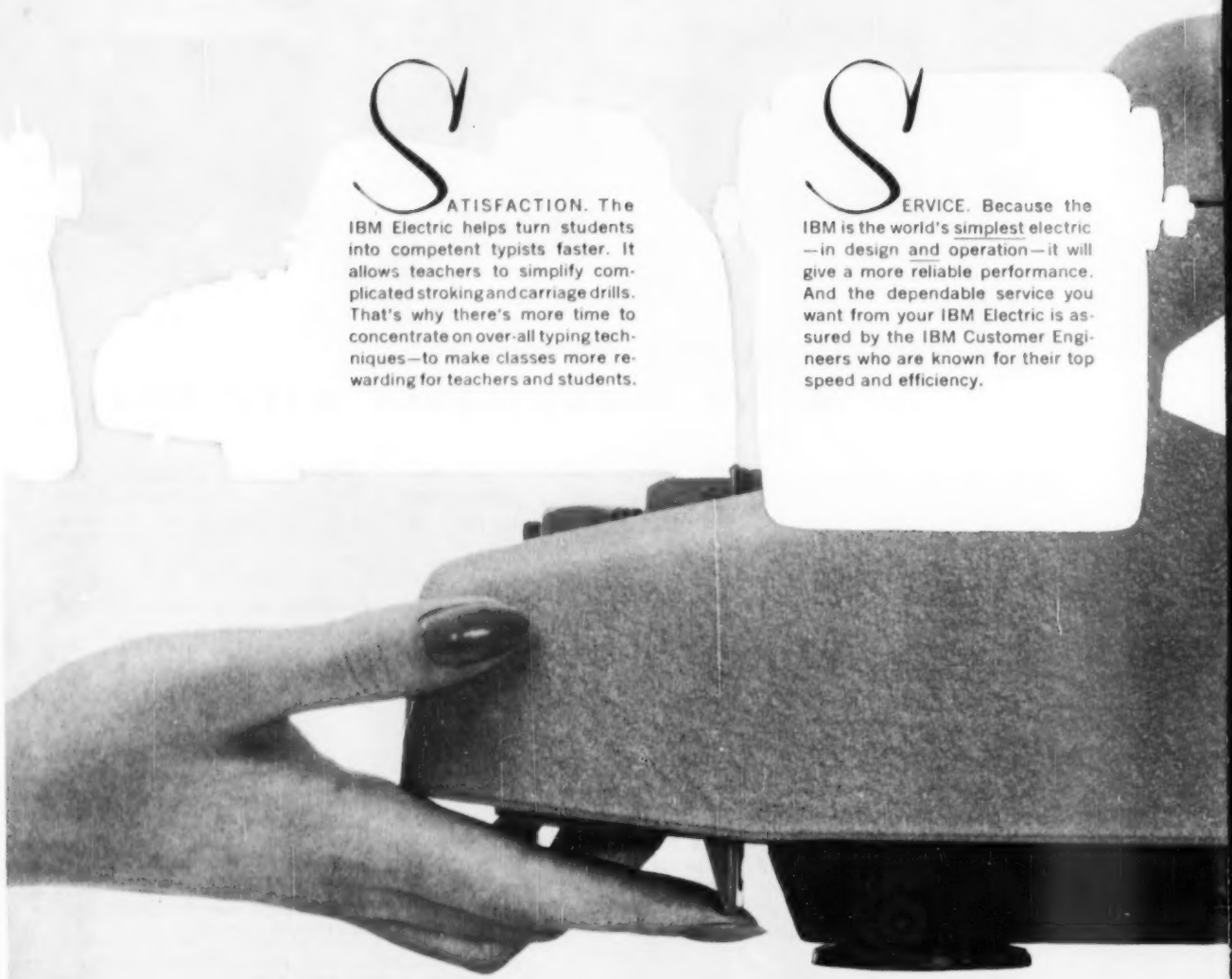

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1. *Install* WEBER COSTELLO CHALKBOARDS

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As manufacturers of all 3 — chalkboards, chalk and erasers — Weber Costello has learned how to build GOOD Chalkboards, and how to manufacture chalk and erasers designed for smooth writing and easy complete erasing. For the FINEST CHALKBOARD WRITING-SURFACE—Specify and Install:

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A new concept in finest quality, dustless chalk. Designed to reduce eyestrain through restful contrast with chalkboard writing surface. Pleasing golden ivory color. Firm, extruded sticks for maximum "mileage". Ideal for modern green chalkboard—a "must" for black chalkboards. Regular and triple-size sticks.

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Unquestionably the most effective and time-saving eraser manufactured. Two erasers in one from a standpoint of extra wear; will last for years and years. Molded spring wool felt sections are bound to each other and to eraser back by ten separate sewings. They clean thoroughly, pick up and hold erased chalk.

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TEACHERS' SALARIES

★ The school board of Grosse Isle, Mich., has revised its salary schedule, raising the minimum salary for B.A. degree teachers to $4,100 and for M.A. teachers to $4,400. The maximums are $6,100 for B.A. teachers, and $6,400 for M.A. teachers. The amount given for outside experience was increased from $100 to $200, allowing five years.

★ Lancaster, Mass. The school board has adopted a single-salary type schedule for 1957. The schedule sets up three classifications — nondegree, bachelor degree, and master degree. The schedule begins with $3,000 and goes to $4,700 after 10 years' service and a master's degree. Annual increments of $150 will be given all teachers rendering satisfactory service. New teachers with interrupted teaching experience of more than three years, will receive one-half year credit for each year of service.

★ Brockton, Mass. The school board has given an increase of $300 to all classroom teachers, a six per cent increase to supervisory personnel, and an increase of $100 to clerical help, and custodians. The increases will increase the payroll by $200,000.

★ Denver, Colo. The school board has included in its 1957 budget salary increases of $225 a year for most teachers, with comparable amounts for other school employees.

★ Athol, Mass. The school board has raised the maximum salary for teachers holding a bachelor's degree to $4,300 for 1957. The minimum remains at $3,100.

★ Somerset, Mass. The school board has set a new minimum of $3,200 and a maximum of $4,700 for the year 1957. In addition, an improved sick-leave policy extends the annual sickleave time from 10 to 15 days, cumulative to 30 days. Teachers with more than ten years' experience are allowed 15 days.

★ Fall River, Mass. The school board has adopted a new schedule for 1957, calling for a minimum salary of $3,500 and a maximum of $5,000.

★ Melrose, Mass. A general salary increase of $200 has been given to teachers, effective April 1, 1957. The schedule also calls for incentive pay increases for those making a career of teaching. It allows two service increments of $200 each, one to be paid in the fifteenth year of teaching and the other in the twentieth.

★ Danvers, Mass. All teachers have been given increases of $500, effective next September. As of January 1, 1957, teachers holding a bachelor's degree will be paid a minimum of $3,200 and a maximum of $4,800. In September the salaries will be $3,400 minimum and $5,000 maximum.

★ Foxboro, Mass. A new salary schedule has been adopted for 1957–58. The schedule calls for a minimum of $3,400 and a maximum of $5,400.

★ The school board of Malden, Mass., has revised its salary schedule, effective January, 1957. The schedule provides a base pay of $3,100 and a maximum of $5,100 for teachers holding a bachelor's degree. Teachers with a master's degree will be paid a $200 differential in both minimum and maximum salaries; doctorate holders will be paid a $600 differential. The new budget for 1957 provides increments of $200 for teachers serving 15 years or more in the system.

★ Stratford, Conn. The school board has given increases of $400 per year to teachers for 1957. The increases are in addition to the present salary increments and will cost about $209,830.

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NO NEED to stick your neck out for extra work. The new Royal Standard is cram full of time-saving features that help students learn faster—help to make your teaching job easier.

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SCHOOL LAW

(Concluded from page 19)

long as such reconsideration occurs *prior* to the opening of any additional bids submitted as a result of the board's readvertisement.

Third: In the submission of bids on proposed construction work, the *lowest* bidder attains a vested interest in the board's subsequent award of the contract, this interest being subject to defeat only if such bidder is found not to be the *lowest responsible bidder*.

Fourth: To establish that a lowest bidder is not the lowest *responsible* bidder, a school board must make such a finding after notice to the bidder affected, after a hearing and investigation, and in the exercise of its bona-fide discretion.

Fifth: A board's action in rejecting all bids received on an alternate proposal to a general construction contract, in awarding the construction contract, and in readvertising for bids on the same alternate proposal, is a clear indication that the board does not consider the alternate as an integral part of the construction contract.

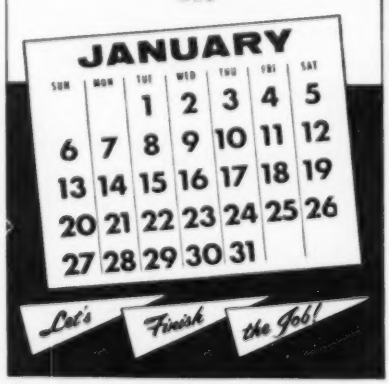
ADOPTS POLICIES

The board of education at Ann Arbor, Mich., has approved three policy statements relating to commencement exercises, use of school buildings, and buying of property insurance. The statements have been made part of the Policy Book which is undergoing revision.

On insurance, the board said it will insure school property unless otherwise directed by the school electors. Insurance will be purchased from mutual, stock, and other responsible companies, and the board will review all aspects of coverage, buying, and services on an annual basis.

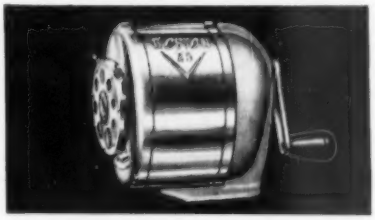
While encouraging the use of school buildings, the board said it will not commit any part of the physical plant to public, semi-public, or private groups on a continuing basis, beyond the limits of a fiscal year, unless such group is directly or indirectly sponsored by the public schools.

JOIN THE MARCH OF DIMES IN



BOSTON KS
for general classroom use

PERFORMANCE—unequalled
IMPROVEMENTS—positive mechanical lock on 8-size pencil guide
CLEANLINESS—no fall-out, nickel-plated receptacle stays put
STRENGTH—rugged "bridge-like" frame, steel rack
EFFICIENT—25% more cutting edges, consistently produce clean, sharp points without waste



BOSTON RANGER
for drawing rooms and heavy duty

- 3 points—outside adjustment
- heavy-duty double bearings for Speed Cutters assure perfectly centered points
- easy-locking stainless receptacle
- takes 6 pencil sizes—no waste

Free comprehensive report on sharpeners in schools, Booklet B.

BOSTON PENCIL SHARPENERS

C. HOWARD HUNT PEN COMPANY
Camden 1, New Jersey

ROCKWELL-BUILT

DELTA 11" metal lathe

Mr. Krimbacher gives student operating pointers. Other Delta tools in the Madison High School shop: two 14" drill presses, Unisaw, four scroll saws, metal shaper, four wood lathes, pedestal grinder.

"... *the* ideal lathe for school shops,"

says Frank Krimbacher, Dir. of Ind. Arts, Madison H. S., Royal Oak, Mich.

MORE FOR THE MONEY—Selection of the Delta 11" Metal Cutting Lathe was made only after close comparison with other competitive lathes. "It is, without a doubt, *the* ideal lathe for school shops," says Mr. Krimbacher. "It offers a lot more for the money and you get genuine industrial quality."

SAFE, DURABLE—According to Mr. Krimbacher, the school has never had a major accident using Delta tools, an even more important reason for selecting the Delta lathe. "Its general appearance, ruggedness and indestructibility are visible at first glance," says Mr. Krimbacher.

VERSATILE, EASY OPERATION—"Although our Delta lathe has been in use for just a short time, it has already proved its versatility over the other metal lathe in our shop," says Mr. Krimbacher. "Its simplicity of design offers the advantage of remarkably easy student demonstration and operation. We highly recommend the Delta lathe regardless of the size of the shop program."

GET ALL THE FACTS—See Delta's entire 11" Metal Lathe line and new production accessories that convert your Delta engine lathe into an efficient production machine at low cost. Your Delta Dealer is listed under "TOOLS" in the Yellow Pages.

Send Coupon Today!

Delta Power Tool Division, Rockwell Manufacturing Co.
408A N. Lexington Ave., Pittsburgh 8, Pa.

Please send:
- ☐ Catalog on Delta 4' and 5' Metal Cutting Lathe Line.
- ☐ Information on new Delta Lathe Accessories.
- ☐ Names of nearest Delta Dealers.

Name _____ Title _____
School _____
Address _____
City _____ County _____ State _____

another product by ROCKWELL

DELTA ... PRIDE OF THE NATION'S SCHOOLS

For folding chairs with comfort, rigidity and enduring service

No. 81

Look to KRUEGER posture-perfect Series 80!

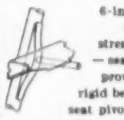
No. 82

For all-around comfort, durable rigidity, strength and functional purpose you can't match *this* folding chair. It's Krueger's finest and *your best long-life value.* Non-tipping Y-type frames of heavy-gauge tubular steel are electrically welded into one strong unit that will withstand the hardest usage.

A WEALTH OF FEATURES — Such as vertical frame strengtheners; strong, secure and silent seat stops; unusually large, posture-comfort seats; fully covered safety hinges; and quiet, quick and easy folding action are just some of the many features built into Krueger's exacting engineering standards.

TWO POPULAR MODELS — No. 81, an all-steel chair with contour shaped seat and backrest; No. 82 which features a 5-ply hardwood veneer contour seat with steel backrest. Choice of Beige, Azure Grey or Saunders Green baked-on enamel finish frames—Wood seat, natural satin finish.

THESE DETAILS ASSURE LASTING SATISFACTION



6-inch built-up frame strengtheners — seat spacers provide more rigid bearings at seat pivot point—prevents frame spreading.

Spot-welded steel seat stops capped with rubber bumpers assure positive seat lock —quiet operation when opening or folding chair.

Fully covered safety hinges prevent finger pinching and clothing tears—a safety factor feature many other chairs do not have.

Demountable CHAIR TRUCKS

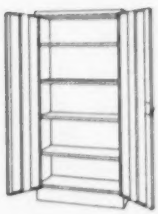
Four standard sizes hold both X-type channel and Y-type tubular chairs — upright or horizontal. Regular or under-stage models available. Demountable end arms and exclusive chan-angle frame permit stacking empty trucks.

Write For new, complete line catalog No. 600 as well as brochure No. 100.

KRUEGER

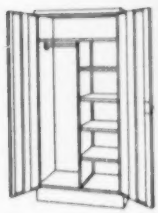
METAL PRODUCTS • GREEN BAY • WISCONSIN

meeting the need for swing-door cabinets in your school



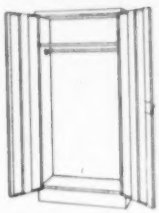
supply

PATENT APPLIED FOR



combination

1 handle does the work of 2



wardrobe

BORROUGHS

"Cyclops" swing-door cabinets

Safe-like swinging doors with a central handle. Smooth interior finish—no projecting lugs. Shelves adjustable on 1" centers without tools. No loose shelf clips. No bolt heads on front, ends or back. Choice of 5 colors, in electrostatic baked-on enamel. These are a few of the many features that are making Borroughs cabinets first choice from coast to coast. Before you decide on any cabinets, be sure to see the Borroughs line.

See your local steel equipment dealer . . if he does not have Borroughs cabinets in stock, he can get them for you.

BORROUGHS MANUFACTURING CO.

A Subsidiary of The American Metal Products Company of Detroit

3048 NORTH BURDICK amp KALAMAZOO, MICHIGAN

FINANCE & TAXATION

SCHOOL BOND SALES

During the month of October, 1956, permanent school bonds for school construction purposes were sold in the amount of $188,833,887. The largest sales were made in:

California	$19,143,000	Missouri	$10,995,000
Illinois	7,026,193	New Jersey	11,347,000
Indiana	19,742,000	New York	18,481,194
Louisiana	5,482,000	Ohio	6,790,000
Maryland	16,668,000	Pennsylvania	16,822,000
Massachusetts	5,829,000	So. Carolina	15,000,000
Michigan	15,056,000	Texas	4,597,000

As of November 21, 1956, the average yield of 20 bonds was 3.21 per cent.

SCHOOL CONSTRUCTION

During the month of November, 1956, contracts were let in 11 western states for 90 school buildings to cost $31,507,050. Additional projects, numbering 114 schools, were reported in preliminary stages, to cost $79,906,122.

During the month of October, 1956, Dodge reported contracts were let in 37 states east of the Rocky Mountains, for 506 buildings at a total contract valuation of $185,414,000.

SCHOOL BONDS

The school board of Parma, Ohio, has issued a 12-page brochure, entitled "Keep Your School Bells Ringing," in which it discusses a proposed $3,200,000 bond issue to go before the voters on November 6. The bond issue is needed to provide enough classrooms to meet enrollment increases anticipated for 1957 and 1958. The bonds will provide two junior high schools, two elementary schools, a multipurpose room, an addition to the bus garage, and improvements of sites and classroom lighting.

★ Nebraska City, Neb. The school board has invested the residue of a school bond sinking fund, amounting to $12,510, in U. S. Treasury Series F bonds.

★ Midland, Mich. Voters approved a $3,100,000 bond issue for new school construction. This was the fourth postwar bond issue for construction totaling $10,050,000.

★ The Kelloggsville school district, Grand Rapids, Mich., has passed a bond issue of $700,000 for the erection of a science-gymnasium office wing for the high school, and a six-room addition to the West elementary school.

★ Gladwin, Mich. A $425,000 bond issue has been approved for a high school addition.

★ Caro, Mich. The Indianfields township has passed a bond issue of $900,000 for a community high school. Glen Beach, Saginaw, is the architect.

★ Grandville, Mich. The school board has has sold $350,000 worth of school bonds to finance three school additions at West Elementary, East Elementary, and Grandville High School.

SCHOOL BUDGETS

★ Fall River, Mass. Adopted $3,722,806 for 1957, an increase of $144,512.

★ Quincy, Mass. Approved $4,500,000, an increase of $391,000.

★ Shreveport, La. Caddo Parish adopted $9,457,734.

★ Somerville, Mass. Adopted $1,102,356, an increase of $101,000.

★ Bridgeport, Conn. Approved $7,425,379, an increase of $1.4 million.

★ Denver, Colo. Adopted $37,105,801 for 1957.

NATIONAL STATISTICS OF IMPORTANCE TO SCHOOLS*

Item	*Date*	*Latest Figure*	*Previous Mo.*
School Building Construction[1]	Oct., 1956	$185,414,000	$184,838,000
School Building Construction[2]	Nov., 1956	$ 31,507,050	$ 19,710,960
Total School Bond Sales[3]	Oct., 1956	$188,833,887	$133,590,852
Latest Price, Twenty Bonds[3]	Nov. 21, 1956	3.21%	2.96%
New Construction Expenditures[4]	Nov., 1956	$264,000,000	$276,000,000
Construction Cost Index[5]	Nov., 1956	644	642
Educational Building, Valuation[4]	Aug., 1956	$107,200,000	$110,700,000
Wholesale Price Index[6]	Nov. 27, 1956	115.9	114.9
U. S. Consumer's Prices[6]	Oct., 1956	117.7	117.1
Population of the U. S.[7]	Oct. 1, 1956	168,921,000	168,838,000

*Compiled December 10, 1956.
[1]Dodge figure for 37 states east of Rocky Mts.
[2]11 states west of Rocky Mts.
[3]Bond Buyer.
[4]Joint estimate, Depts. of Commerce and Labor.
[5]American Appraisal Co., Milwaukee.
[6]U. S. Dept. of Labor.
[7]U. S. Dept. of Commerce.

. . . easier reading
. . . writing
. . . cleaning

WRITE FOR YOUR FREE COPY OF:

"SLATE CHALKBOARDS IN MODERN SCHOOLS"
(contains little-known facts about chalkboard visibility, geographical listing of outstanding modern schools using slate chalkboards, cost comparisons, maintenance tips and authoritative bibliography)

"THINGS THAT MATTER MOST ABOUT CHALKBOARDS"
(discusses six basic considerations in chalkboard selection)

"TIPS ON EASY CHALKBOARD CARE"
(nine time-saving steps for trouble-free chalkboard care, including the scouring technique to eliminate need for future resurfacing)

Nothing equals the ease of teacher-student communication like the superior contrast of white chalk on a natural slate board. Nor have the clean, clear writing and erasing qualities or easy maintenance of slate ever been duplicated. In fact, the unsurpassed smoothness of slate is the standard to which all other chalkboards are compared. Ageless in appearance, slate harmonizes with any color scheme, never "dates" the classroom. No wonder so many teachers request . . . so many architects specify natural slate chalkboards for the best in visual classroom service!

PENNSYLVANIA SLATE PRODUCERS GUILD, INC.
205 Realty Building Pen Argyl, Pennsylvania
500 million years in the making . . . NATURAL SLATE

Superior Design, Construction and PERFORMANCE

far greater strength and SAFETY!

AMERICAN Approved

PLAYGROUND AND SWIMMING POOL EQUIPMENT

The wise choice of experienced buyers for nearly half a century.

WRITE FOR LITERATURE

AMERICAN PLAYGROUND DEVICE CO.
ANDERSON, INDIANA, U.S.A.
WORLD'S LARGEST MANUFACTURERS OF FINE PARK, PICNIC, PLAYGROUND, SWIMMING POOL AND DRESSING ROOM EQUIPMENT

Monroe FOLDING BANQUET TABLES

Direct Prices & Discounts to Schools, Churches, Clubs, Lodges and All Organizations

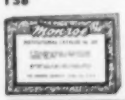
Full line of folding chairs

MONROE TRUCKS

Transport and store your folding tables and chairs the easy, modern way with Monroe All-Steel Trucks. Each truck is designed to handle either tables or chairs. Construction of Truck No. TSC permits storage in limited space.

Above: Transport-Storage Truck No. TSC

Right: Transport-Storage Truck No. TS8



WRITE FOR CATALOG, PRICES AND DISCOUNTS

THE Monroe COMPANY
6 CHURCH STREET, COLFAX, IOWA

NEW Catalog SHOWS 1957 LINE

In this new catalog, you'll see illustrated and described the many types of fountains or coolers for industrial use and the many features that make the Halsey Taylor line outstandingly superior.
The Halsey W. Taylor Co., Warren, O.

Halsey Taylor®
FOUNTAINS
COOLERS
ENGINEERED THE BEST TO MEET EVERY SERVICE TEST

MAIL COUPON TODAY

The Halsey W. Taylor Co., Warren, Ohio ASJ 70
Please send us 1957 catalog, showing complete line
Company
Name Title
Address
City State

LIGHTING SURVEY

(Concluded from page 54)

brightness of any surface viewed from any normal standing or sitting position in the schoolroom should not be less than one third the foot-lambert brightness of the poorest lighted task in the room. The foot-lambert brightness of any surface immediately adjacent to the task should not exceed three times the task brightness. Brightness-difference between adjacent surfaces should be reduced to a minimum.

2. *Sufficient light at each desk station for all school tasks.* The National Council on Schoolhouse Construction recommends that the brightness goals stated above assume a lighting system that provides from 20 to 40 foot-candles on the poorest lighted task.

3. *School lighting that is easily controlled without undue attention from the teacher.* Outside lighting sources change frequently during the day and may even change several times in a period of a few minutes. Teachers are too busy on other tasks to note all these changes, so it seems only reasonable that the lighting of the classroom be as automatic as possible.

4. *Light that is easily controlled for the use of audio-visual education aids.* It is necessary to see that classrooms are designed so that rooms can be satisfactorily darkened when visual aids are being used. If the processes of darkening a room are too complicated, or if the proper degree of darkening cannot be achieved, it is probable that the visual aids simply will not be used. This is also true when the room darkening equipment is too expensive. The room darkening equipment should not interfere with the adequate ventilation of the room or be in the way when not in use. This is an important factor which must be kept in mind at the time the building is designed and not thought of as something that can be added at a later date.

Meeting these classroom lighting objectives contributes to educationally flexible classrooms which permit a teacher to provide seating and grouping in any manner best suited for the learning situation at hand. There is freedom here to work within an educational space rather than to work in a restricting area. With proper lighting making freedom of movement possible within the area, other educational helps such as movable cabinets become practical.

School boards, architects, and superintendents can no longer do just a "fair" job of school lighting. School buildings will always, we hope, be designed in great variety, but competition is demanding that the lighting criteria be met as a minimum requirement.

. . . just a pinch

That's all the Puritine you need. A single, economical ounce of Puritine in a gallon of water gives you a super-fast cleaning solution. Use Puritine on walls or floors, on fixtures or equipment . . . in fact, any place where water can be used. Puritine dissolves grease and dirt in record time, rinses freely and actually costs only one-fourth as much as most cleansers. Ask your Holcombman for a demonstration. He can show you in minutes how to save hours of cleaning time.

HOLCOMB SCIENTIFIC CLEANING MATERIALS

J. I. HOLCOMB MFG. CO., INC. • 1601 BARTH AVE., INDIANAPOLIS, INDIANA

New York • Dallas • Los Angeles • Toronto

News of Products for the Schools

MOBILE GYMNASIUM SEATING

A new free-standing, mobile gymnasium seating unit has been announced by the Brunswick-Balke-Collender Co., Chicago, Ill. Unlike a movable unit, it does not require floor plates

New Folding Seating

or wall attachments. It is moved by means of mobile trucks to the area where additional seating is required. It provides an installation with maximum flexibility where seating arrangements must be changed to meet the requirements of school dances, boxing, basketball, or chess tournaments. Furnished to a maximum height of 10 rows, the unit incorporates all of the features of the Brunswick line including full chair height seating, exclusive standard skirt boards, full automatic locking and ease of operation.

(For Further Details Circle Index Code 0195)

FINE PRECISION

PENCIL SHARPENER

SAVES TIME AND CONFUSION

Always a sharp pencil with a quick twist of the wrist. No more distracting trips to pencil sharpener. Spillproof container, replaceable razor-sharp blade. Choice of 3 smart colors.

Only 50¢ each retail

At your supply dealer or write to address below.

For wholesale quantities write for complete catalog of 24 highly specialized models for pencils and crayons.

FRED BAUMGARTEN

Exclusive Imports

1000 Virginia Ave. N.E. Dept. P-2
Atlanta 6, Ga.

MOVIE EXPLAINS TYPEWRITER USES

A motion picture explaining the many important uses and adaptations of today's versatile typewriter has been prepared by the Remington Rand Co., New York 10, N. Y. The film entitled, "The Typewriter in Business" demonstrates the purpose and use of important typewriter devices, attachments, keyboards, and other variations, and shows how an office can run more efficiently with these modern typing developments and with well-trained people to operate the modern typewriter. Every major use of electric, manual, and noiseless typing is covered, from the simplest straight copy typing to the most complex automatic typing initiated by a giant electronic system like Univac. Schools, business firms, and government agencies may make arrangements to view the film without charge by contacting their local Remington Rand sales office. The film is 16mm. black and white and lasts 20 minutes.

(For Further Details Circle Index Code 0196)

BOY-PROOF SHOP FURNITURE

Standard Pressed Steel Co., Jenkintown, Pa., recently introduced two pieces of school shop furniture which they say are "boy proof." These are a drawing table and tool cabinet designed and built to resist and minimize damage by student neglect or mischief.

The drawing table consists of a laminated 1¼ inch wood-top set at a fixed angle on a base of heavy-gauge satin finished aluminum tubing. Joints between the legs and the cross-braces add to the clean, functional appearance of the table while insuring maximum rigidity without unnecessary bulk. A single drawer slide, but no drawer, is installed under the working surface of the table. Thus if several students are to use the table, individual storage units may be purchased for each and stored in a cabinet designed for that purpose.

The "boy-proof" tool storage cabinet comes in two models. One is designed for installation on wall hangers; the other is intended for use as a floor cabinet. Both have all steel pegboards which resist damage and wear and neither when locked can be opened by removal of the door hinges, back or sides.

(For Further Details Circle Index Code 0197)

IMPROVED SLIDEFILM PROJECTOR

A slidefilm projector on which four major improvements have been made has been introduced by Du Kane Corp., St. Charles, Ill. The improved model, called the "Micromatic" uses a unique "inside out" film feed mechanism, a new film transport device, redesigned "jet" air cooling, and an improved automatic sound.

The need for rewinding filmstrips is nonexistent with this model for film is fed into the projector from the *inside* of a roll of film. It is also wound very compactly by a mechanical take-up and can be easily inserted into the storage container, immediately ready for the next showing. The improved forced air cooling system reduces heat of the film approximately 30 per cent. Scratching and other wear on the film as it passes through the aperture plates is prevented by a mechanism which separates the plates to allow the film to run free of any contact almost the entire distance between frames.

(For Further Details Circle Index Code 0198)

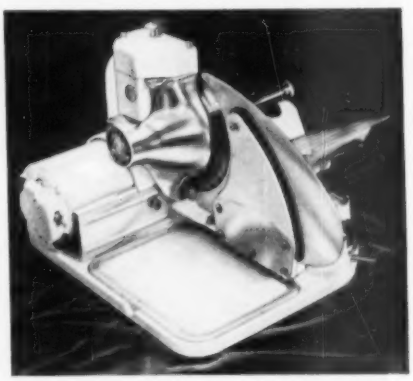
CONTINUOUS WARNING ALARM

A constant ringing drop, designed particularly for alarm systems where immediate attention is required for protection of personnel and equipment, and where reset feature is needed for restoration of the alarm system, has been announced by the Edwards Co., Inc., Norwalk, Conn. The constant ringing drop is particularly well suited for many types of industrial control alarms, fire alarm systems and annunciators. It operates in the low voltage circuit that may be supervised by thermal, liquid level, tachometer switch, voltage or current relay, or other device sensitive to specific conditions. When the controlled condition is returned to normal, warning devices can be silenced or cut out by means of a convenient reset button under the drop. The drop will recycle with the return of alarm conditions.

(For Further Details Circle Index Code 0199)

NEW MEAT SLICER

Uniform meat slicing is assured with the new Profit Maker Model 50, announced by the American Slicing Machine Co., Chicago 11, Ill. The horizontal feed slicer has a spring mechanism which feeds meat to the knife with an even pressure. Two stages are provided to accommodate both small and large pieces of meat. Only the actual cutting edge of the Mira-Clean contour knife touches the food being sliced.



Meat Slicing Machine

This model also features a swivel knife sharpener. A half turn of the housing swings the sharpening stones into position. Operator moves sharpener knob back and forth to sharpen knife. When not in use, sharpener stones are kept away from food being sliced and so retain their abrasive qualities.

(For Further Details Circle Index Code 0200)

SILENT OPERATING FAN

A new, compact, silent operating cabinet fan designed especially for crowded institutional and commercial buildings, has been developed by the Trane Co., La Crosse, Wis. Ideally suited for use in schools, hotels, and other buildings which have low ceilings it requires minimum installation space. It can be located over doorways, in closets, or other out-of-the-way places. The versatile fan is adaptable for use in air moving systems for introduction of fresh ventilation air, for exhausting purposes, and for recirculation of interior air. One and two-fan models are available in 12 sizes with air delivery ranging from 600 to 34,500 cubic feet per minute.

(For Further Details Circle Index Code 0201)

(Continued on page 98)

HEYWOOD-WAKEFIELD
EST. 1826

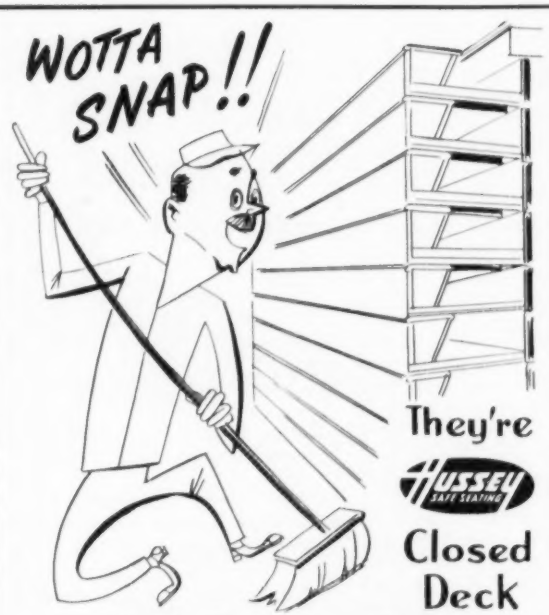
Trim Line

New simplicity of design achieves style, comfort and classroom efficiency with strength to pass the test of time.

WRITE FOR COMPLETE CATALOG OF TUBULAR STEEL FURNITURE

Patents are pending on all the pieces of the Heywood-Wakefield Trim Line design. Heywood-Wakefield, School Furniture Division, Gardner, Mass. and Menominee, Mich.

WOTTA SNAP!!



They're HUSSEY SAFE SEATING Closed Deck

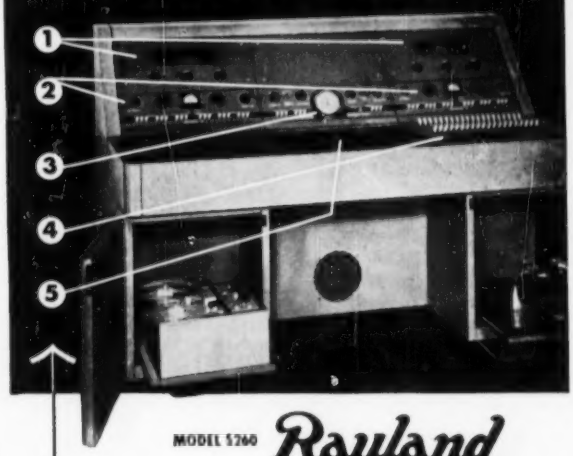
Roll-Out Gym Seats

All-closed deck construction means a clean floor under the stands. There's no need to laboriously sweep under the seats before rolling them away. Good looking, they're safer, too, and reduce insurance costs. Ideal for schools, auditoriums, armories, etc. Write for FREE CATALOG.

HUSSEY MFG. CO., Inc.

5717 R. R. Avenue North Berwick, Maine

the ultimate in CENTRAL CONTROL ALL-FACILITY SCHOOL SOUND



MODEL S260 Rauland

Dual-Channel All-Program System PLUS Intercommunication

NOW, you can have the most *complete* program, distribution and operational facilities ever designed in a School Sound System. The RAULAND S260 Console, with facilities for up to 160 classrooms, simplifies administrative control, provides the most versatile distribution of microphone, radio, phonograph and recorder programs to enhance instruction, and offers simultaneous 2-way communication between any classroom and central control Console. Here, truly, is the ultimate in School Sound.

1. **FM-AM RADIOS:** Two (2) supplied. Selects for distribution to any or all rooms, any radio program on the complete FM band or the entire AM standard Broadcast Band.
2. **PROGRAM PANELS:** Two (2) supplied—selects any two of 6 microphones and mixes them as desired, or mixes one microphone with Radio, Room-Return or any one of 4 programs—Transcription Phono, Record Changer, Tape Recorder or Remote Line.
3. **MASTER CONTROL PANEL:** Provides 2-way conversation with any room. Includes one-operation Emergency Switch placing Console microphone instantly in contact with any or all room speakers. Also includes for 2 automatic Program Clock and Monitor Speaker controls.
4. **SWITCH PANEL:** Selects any or all rooms (available with up to 160 room capacity) for program distribution. Switches provide distribution for 2 programs, for intercommunication and for room-return.
5. **TRANSCRIPTION PLAYER:** Plays records of all sizes and speeds, including 16" transcriptions. Record Changer and/or Tape Recorder may also be used with facilities to distribute all three programs.

WRITE FOR FULL DETAILS

RAULAND-BORG CORPORATION

Rauland-Borg Corporation
3515-R West Addison St., Chicago 18, Ill.

Send full details on RAULAND School Sound Systems. We have
....classrooms; auditorium seats.....

Name.....Title.....

School.....

Address.....

City.....Zone.....State.....

FLAGS FOR SCHOOLS

FOR ECONOMY BUY THE BEST—BUY DETTRA

Famous "BULLDOG" U. S., State, and School Flags for Outdors

Beautiful, lustrous "GLORY-GLOSS" U. S., State, School and College flags for parade and indoor use — (Complete outfits available with Pole, Ornament,* Carrying Belt and Stand*)

Economical U. S. "AMERIGLOSS" printed flags for schoolrooms

Long-lasting "DURA-LITE" Nylon flags and Outfits for Parade and platform use

Christian, Papal and Zion Flags

*Ornaments and Stands have durable Jewelers Golden Finish

New DETCO PROCESS State Flags printed in full color — sun and rain fast — very economical

•

ASK ABOUT DETTRA'S MOVIE "OUR U. S. FLAG" The Freedom Foundation Award winning 16 mm color sound film . . . the ideal way to tell the story of our flag.

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For complete information and descriptive literature about our flag products and film, call your Local Dettra Dealer or write direct to — Dept. AJ

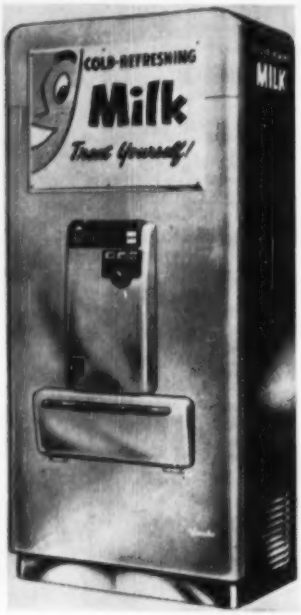
DETTRA FLAG CO., INC.
Oaks, Pennsylvania
Flagmaker to the Nation for more than 50 years

News of Products . . .

(Continued from page 96)

SELECTIVE MILK VENDER

Dairy-Vend, an automatic milk vender, will simplify service and record keeping for the school lunch supervisor. The machine collects the money and keeps an accurate count on the number of cartons sold. It may be set for a three-cent milk collection, then reset to 10 cents after the lunch period.



Work-Saving Machine

This attractive two-tone steel vender holds 237 half pints or 165 pint cartons. Local dairies may stock it with three beverages, for example, with white and chocolate milk and orange juice. Occupying only four square feet of floor space, Dairy-Vend has ¼ h.p. hermetically sealed refrigeration unit. It is made by the Vendo Co., Kansas City, Mo., manufacturers of automatic vending machines for orange juice, ice cream, and hot "main dish" foods.

(For Further Details Circle Index Code 0202)

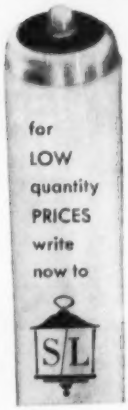
WORKSHOP DUST COLLECTOR

A rugged, versatile new dust exhaust system which not only keeps workshops living-room clean but also can perform dozens of other chores has been introduced by Rockwell Manufacturing Co., Pittsburgh Pa. The new machine combines for the first time the utility and power of an industrial dust collector with the versatility and mobility of a vacuum cleaner. Easily attached to any workshop power tool and easily rolled from one tool to another it can automatically remove dust, chips, smoke, metal filings, etc., that usually accompany shopwork. It is powerful enough to pick up nuts, bolts — even a 1-inch steel ball. None of the items picked up come in contact with the suction fan blades. Thirteen valuable accessories, including a long, slim crevice tool and a paint sprayer attachment are also available to increase the versatility of the dust collector.

(For Further Details Circle Index Code 0203)

(Concluded on page 100)

HEAVY DUTY
Slimline
FLUORESCENT LAMPS
TOP IN QUALITY
and low in price too!



maintains brightness longer
much longer lamp life
consistent superior quality

YOUR SCHOOL DOLLARS GO FARTHER WITH LAMPS BY

SUPRO LUX
manufacturing co., inc.
412 EAST 161st STREET
BRONX 51, NEW YORK

School Administrators

BEACH FRONT GARDENS

WELCOMES YOU!

FREE TV
OPEN ALL YEAR
PARKING AT YOUR DOOR
AAA APPROVED

For comfort and convenience, make Beach Front Gardens Motel your convention headquarters. Lots of shops and entertainment spots nearby. Take advantage of special low convention rates and make your reservation early.

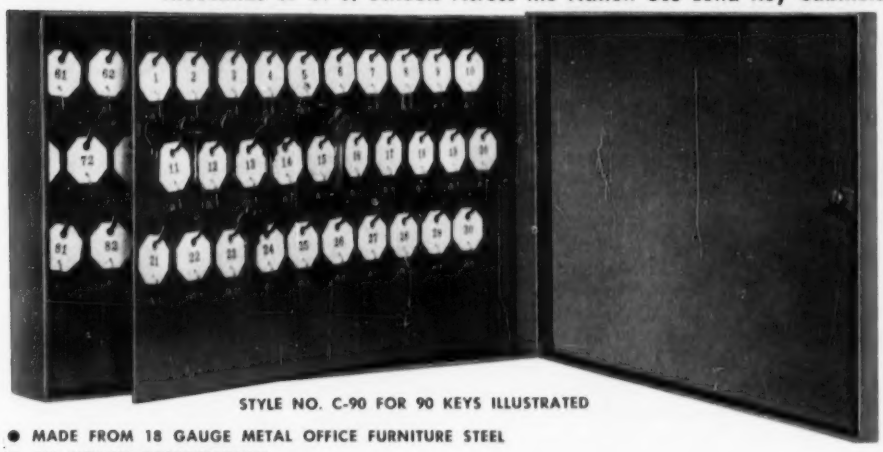
192 Rooms, 96 with Kitchenettes

Boardwalk at Massachusetts Ave.
ATLANTIC CITY 4-0444

LUND SCHOOL KEY CABINETS

SIMPLEST AND MOST INEXPENSIVE KEY SYSTEM EVER DEVISED

Thousands of U. S. Schools Across the Nation Use Lund Key Cabinets



STYLE NO. C-90 FOR 90 KEYS ILLUSTRATED

School Key Cabinets by **LUND** For Nearly 25 Years

- MADE FROM 18 GAUGE METAL OFFICE FURNITURE STEEL
- ALL WELDED CONSTRUCTION
- LIGHT GRAY BAKED ON ENAMEL FINISH
- DOOR HAS CHROME PLATED CYLINDER LOCK
- KEY SYSTEM INCLUDES NUMBERED WHITE FIBRE KEY TAGS, KEY RECEIPT CARDS, TRIPLE CROSS INDEX CONTROL CARDS AND FULL INSTRUCTIONS

Write for Catalog and Prices

LUND EQUIPMENT CO. **BRECKSVILLE, OHIO**

EXTRA YEARS

of Clean, Safe, Quiet Operation
. . . at low initial cost

★

TODD BURNERS

GAS OR OIL

★

PRODUCTS DIVISION
TODD SHIPYARDS CORPORATION

Headquarters:
Columbia & Halleck Streets, Brooklyn 31, N. Y.
Plant:
Green's Bayou, Houston 15, Texas

TODD

MAYLINE

Two Fine Tables For Your Classroom

The C-7702 Art Table has a 20" x 24" metal edge, adjustable drawing top and a 20" x 10" metal edge reference top. Drawing table C-7703B has a 30" x 42" solid basswood metal edge adjustable top. Roomy drawers are individually keyed. Board compartment holds six boards 21" x 26". Base of each table is oak. Choice of finish golden oak or natural.

Both tables wil be on display when you visit us in booths 1324-26, AASA Convention, Atlantic City, February 15-20.

Symbol of MAYLINE *Superiority*

MAYLINE COMPANY
527 No. Commerce St.
Sheboygan, wisconsin

C-7703B DRAWING TABLE

MAYLINE

News of Products . . .

(Concluded from page 98)

Versatile Food Scale

PORTION CONTROL SCALE

School lunch supervisors will like the versatility of the new portion control scale, Model YG-425, offered by the Pelouze Mfg. Co., Evanston, Ill.

Its main use is for weighing recipe ingredients directly into a mixing bowl, without figuring the weight of the container. The bowl is placed on the scale, the rotating dial pointer set to zero and then the first ingredient added. As each ingredient is added the dial is reset to zero. The laminated plastic dials may be marked with a wax pencil, and easily wiped clean. Another use for the scale is to check incoming food weighing up to 25 pounds, with an accuracy of ½ ounce. A companion model, Y-32, weighs individual portions up to two pounds, with an accuracy of 1/16 of an ounce. Plate weight is subtracted by setting dial pointer up to zero.

(For Further Details Circle Index Code 0204)

CATALOGS & BOOKLETS

FLOOR MAINTENANCE MAGAZINE

A quarterly magazine containing up-to-date articles on floor treatment problems is being published by the Hillyard Chemical Co., St. Joseph, Mo. The first issue, dated Fall, 1956, which was recently released contains an article on the cleansing procedure to be followed for resilient floors, first id tips for asphalt tile floors, hints for proper treatment of terrazzo floors and several other helpful articles. Copies of the magazine entitled, "Floor-O-Scope" may be obtained free.

(For Further Details Circle Index Code 0205)

Two new catalog sheets picturing and describing steel stools, chairs, shelving, workbenches, carts and storage and wardrobe cabinets are available free from the Lewis Steel Equipment Corp., Carlstadt, N. J.

(For Further Details Circle Index Code 0206)

Science and home-economics teachers may be interested in a four-page booklet, "The Miracle of 'Man-Made' Reinforced Cellulose Sponges" prepared by the Nylonge Corp., New York 17, N. Y. Copies are available on request.

(For Further Details Circle Index Code 0207)

A 40-page catalog describing its line of quiet operating, large capacity, slow speed centrifugal fans has been published by the Chicago Blower Corp., Franklin Park, Ill. Free copies of the catalog are available.

(For Further Details Circle Index Code 0208)

A wide line of laboratory apparatus and supplies, 1500 items in number, are described in the 1957 order book recently released by Central Scientific Co., Chicago, Ill. The 48-page book, which will be sent on request, contains a special section showing agricultural teaching aids for teachers located in rural areas, as well as price lists, order blanks, and photos of most items.

(For Further Details Circle Index Code 0209)

MANUFACTURERS' NEWS

The American Crayon Co. and the **Joseph Dixon Crucible Co.** recently announced a merger of their two concerns. Both companies will continue their operations without change of personnel or policy and their headquarters, plant operations and sales staffs will be maintained separately, as at present.

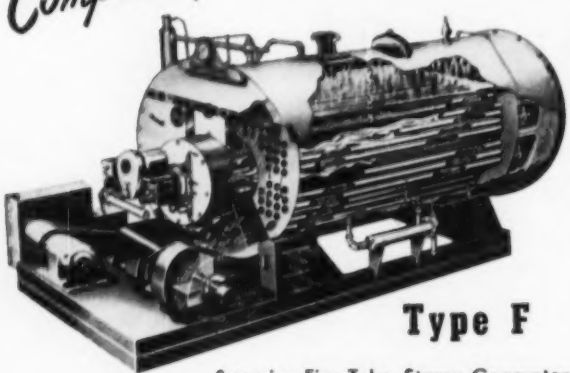
International Business Machines Corporation recently announced the signing of a contract with the U. S. Atomic Energy Commission to begin developing STRETCH, a general-purpose super-computer, for installation at Los Alamos Scientific Laboratory.

The Trane Co., La Crosse, Wis., has announced plans to double its present research and testing facilities — the "House of Weather Magic" — and to build two new manufacturing plants, one to produce brazed aluminum special heat transfer units and the other to manufacture low horsepower air conditioning compressors.

Johnson Service Co., Milwaukee, Wis., manufacturers of automatic temperature control systems, has established new branch offices at Fort Worth, Tex., and Savannah, Ga.

O. E. Barron, New Orleans, La., has been appointed District Manager by the **Electro Silv-A-King Corp.** of their territory encompassing Louisiana, southern Mississippi, Mobile, Alabama, and Pensacola, Fla.

Completely PACKAGED BOILERS



Type F

Superior Fire Tube Steam Generators are completely factory assembled and tested. Capacities range from 20 to 600 b.h.p. for steam or hot water heating and for industrial applications requiring pressures to 250 p.s.i. Built-in induced draft and full 5 sq. ft. of heating surface per b.h.p. provides efficient operation firing oil, gas or both.

Write today for details in Catalog 780 F

for performance you can BANK on SUPERIOR STEAM GENERATORS

SUPERIOR COMBUSTION INDUSTRIES INC.
TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.

HALF TONE and LINE ETCHINGS COLOR PROCESS } premier

The Finest in Black and White and Color Engraving

SERVICE • DEPENDABILITY

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premier engraving co.
818 W. Winnebago St. - Milwaukee 5, Wis.

READER'S SERVICE SECTION

INDEX TO SCHOOL EQUIPMENT

The index and digest of advertisements below will help you obtain free information, catalogs, and product literature from the advertisements and companies listed in the new products section. Merely encircle the code number assigned to each firm in the request form below, clip the form and mail it to THE AMERICAN SCHOOL BOARD JOURNAL. Your request will receive prompt attention.

Code No.		Page No.
10	**All-Steel Equipment, Inc.** Steel furniture and lockers.	73
11	**American Bitumuls & Asphalt Co.** Asphalts, cutbacks and bitumuls.	79
12	**American Crayon Company** Crayonex. Write for information on newest process.	90
13	**American Desk Mfg. Co.** Chair desks.	24
14	**American Playground Device Co.** Playground and swimming pool equipment.	94
15	**American Seating Company** ...inc. bet. 66 and 69 School seating.	69
16	**Baumgarten, Fred** Fine precision pencil sharpener.	96
17	**Bay West Paper Co.** Cut towel costs with "Turn-Towle."	10
18	**Beach Front Gardens Motel** Welcome school administrators.	98
19	**Bendix-Westinghouse Automotive Air Brake Co.** Air brakes.	71
110	**Berlin Chapman Company** ...4th cover Ez-a-Way bleachers.	
111	**Borroughs Manufacturing Co.** Swing-door cabinets.	92
112	**Butler Manufacturing Company** Steel buildings.	25
113	**Celotex Co., The** Sound conditioning. Use coupon on page 26 for survey sheet and booklet.	26
114	**Claridge Products & Equipment, Inc.** Duractie chalkboard. Send for catalog 417.	84
115	**Delta — Rockwell Power Tool Division** 11" metal cutting lathe. Use coupon page 91 for catalog and information.	91
116	**Dettra Flag Company, Inc.** School flags. Write for information and literature.	98
117	**Fenestra Incorporated** ...4 & 5 Acoustical — Structural Building Panels. Free catalog and details use coupon page 5.	
118	**Flexicore Company, Inc.** Precast concrete floors and roofs. Use coupon page 80 for new folder.	80
119	**General School Equipment Co.** School seating.	11
120	**Griggs Equipment, Inc.** School seating	72
121	**Guth Co., Edwin F.** ...2nd cover School lighting.	
122	**Herman Nelson Unit Ventilator Products, American Air Filter Co., Inc.** ...12 & 13 Classroom cooling, heating and ventilating.	
123	**Heywood-Wakefield Co.** Tubular steel furniture.	97
124	**Hillyard Chemical Company** Floor treatment products.	77
125	**Holcomb Mfg. Co., J. I.** Super fast cleaning solution. Ask for demonstration.	93
126	**Hunt Pen Co., C. Howard** Pencil sharpeners.	90
127	**Hussey Mfg. Company** Roll-out gym seats.	97
128	**International Business Machines Corp.** ...86 & 87 Electric typewriters.	
129	**Johnson Service Company** Dual temperature control.	2
130	**Kewaunee Mfg. Company** Portable, self-contained lab demonstration table. Use coupon page 70 for details.	70
131	**Krueger Metal Products** Folding chairs and demountable chair trucks.	92
132	**Lund Equipment Co.** School key cabinets.	99
133	**Maple Flooring Manufacturers Assn.** Northern hard maple.	22
134	**Mayline Co.** Drawing and art tables.	99
135	**Medart Products, Inc., Fred** Basket ball backstops.	15
136	**Metalab Equipment Corp.** School laboratory equipment.	16

USE THESE CARDS

These postpaid cards are provided for the convenience of THE AMERICAN SCHOOL BOARD JOURNAL readers in requesting information on products, services, booklets, and catalogs offered by the advertisers in this issue.

January, 1957

THE AMERICAN SCHOOL BOARD JOURNAL
400 North Broadway, Milwaukee 1, Wis.

Please ask the manufacturers, whose code numbers I have encircled, to send me free information, catalogs or product literature as mentioned in this issue of the JOURNAL.

ADVERTISING INDEX

10 11 12 13 14 15 16 17 18 19 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136

NEWS OF PRODUCTS FOR THE SCHOOLS

Also information on

Name _____ Please Print

Title _____ School

City _____ Zone _____ State _____

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Also information on

Name _____ Please Print

Title _____ School

City _____ Zone _____ State _____

USE THESE CARDS

The cards below are postpaid and perforated for your convenience in requesting product information, catalogs, and literature from advertisers and firms listed in this issue.

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AMERICAN SCHOOL BOARD JOURNAL

P.O. Box No. 2068

MILWAUKEE 1, WISCONSIN

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MILWAUKEE 1, WISCONSIN

No Postage Stamp Necessary If Mailed in the United States

READER'S SERVICE SECTION

(Continued)

Code No.		Page No.
137	**Mississippi Glass Company**..... Rolled, figured and wired glass.	20
138	**Monroe Company, The**..... Folding banquet table.	94
139	**Nesbitt, Inc., John J.** Inc. Inst. 16 & Wind-O-Line Radiation.	19
140	**Penn Metal Company, Inc.**..... Lightsteel for interior walls.	8
141	**Pennsylvania Slate Producers Guild**.. Natural slate.	98
142	**Powers Regulator Co.**..... Temperature and humidity control.	21
143	**Premier Engraving Company**..... Engravers.	100
144	**Rauland-Borg Corp., The**..... School sound systems. Use coupon page 97 for full details.	97
145	**RCA Victor Div. Radio Corp. of America** ..... Educational aids. Use coupon page 85.	85
146	**Remington Rand, Inc.** ..... Record protection. Write for folders.	83
147	**Richards-Wilcox Mfg. Co.**..... FoldeR-Way aluminum partitions.	69
148	**Royal Typewriter Company, Inc.**... Standard, electric and portable typewriters.	89
149	**Safway Steel Products, Inc.**..... Telescoping gym seats. Write for bulletin 161.	65
150	**Schieber Sales Company**..... Folding tables.	7
151	**Sexton & Company, Inc., John** .....3rd cover Institutional food.	
152	**Sheldon Equipment Co., E. H.**..... Educationally correct furniture for science, homemaking, industrial arts.	82
153	**Shwayder Brothers, Inc.**..... All steel folding chairs in 10 decorator colors.	78
154	**Sloan Valve Company**..... Flush valves.	1
155	**Southern California Plastering Institute** ..... Genuine lath and plaster.	6
156	**Stran-Steel Corporation** ..... Structural systems. Use coupon page 23 for information.	23
157	**Structural Slate Co.**..... Natural slate.	76
158	**Superior Combustion Industries, Inc.** ..... Steam generators.	100

Code No.		Page No.
159	**Supro Lux Manufacturing Company.** Slimline fluorescent lamps.	98
160	**Taylor Company, Halsey W.**..... Drinking fountains and electric coolers.	94
161	**Todd Shipyards Corporation**..... Gas or oil burners	99
162	**Universal Bleacher Company**..... New powerroller for some of operating folding bleachers.	75
163	**Upright Scaffolds** ..... Scaffold-on-Wheels.	81
164	**Vogel-Peterson Co., Inc.**..... Wardrobe systems. Write for "Schoolline" catalog SL-206.	82
165	**Weber Costello Company**..... Chalkboards, chalk, erasers, etc. Send for catalog GA-57.	88

News of Products for the Schools

0196	**Brunswick-Balke-Collender Co.** ..... Gymnasium Seating	96
0196	**Remington Rand Co.**..... Typewriter Education Film	96
0197	**Standard Pressed Steel Co.**..... Shop Furniture	96
0198	**Du Kane Corp.**..... Slidefilm Projector	96
0199	**Edwards Co., Inc.** ..... Warning Alarm	96
0200	**American Sliding Machine Co.**..... Meat Slicer	96
0201	**Trane Co.** ..... Cabinet Fan	96
0202	**Vendo Co.** ..... Milk Vendor	98
0203	**Rockwell Manufacturing Co.**..... Workshop Dust Collector	98
0204	**The Pelouze Mfg. Co.**..... Food Scale	100
0205	**Hillyard Chemical Co.**..... Floor Maintenance Magazine	100
0206	**Lewis Steel Equipment Corp.**..... Catalog Sheets	100
0207	**Nylonge Corp.** ..... Booklet	100
0208	**Chicago Blower Corp.**..... Catalog	100
0209	**Central Scientific Co.**..... Order Book	100

FAMED FOR FINE FOOD FOR 74 YEARS

Sexton Quality Foods

Across the country, you see the distinctive trucks of the far-famed Sexton great white fleet supplying more than 60,000 establishments from restaurants to hospitals, from schools to railway dining cars. Sexton service is keyed to the particular needs of those who feed many people each day and all the various Sexton products are delivered direct to the storeroom of each Sexton customer. At all times, there is a helpful Sexton salesman in your community—trained to the special requirements of the institutional market. Fully stocked nation-wide Sexton branch warehouses insure immediate service.

JOHN SEXTON & CO.
CHICAGO
LONG ISLAND CITY
SAN FRANCISCO
PHILADELPHIA
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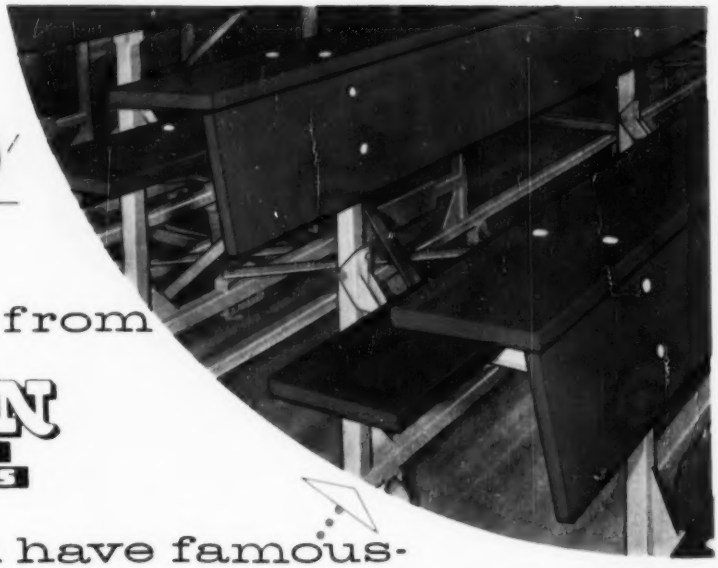
PITTSBURGH
DALLAS
ATLANTA
DETROIT
INDIANAPOLIS

another big

first from

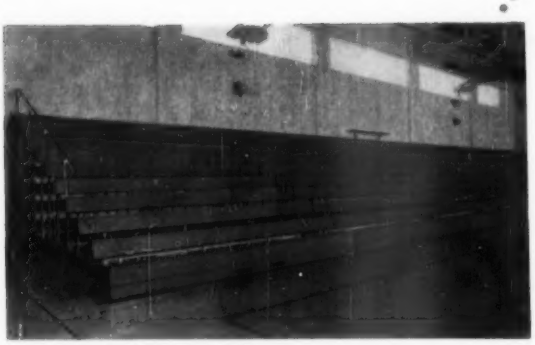
BERLIN SEATING ENGINEERS



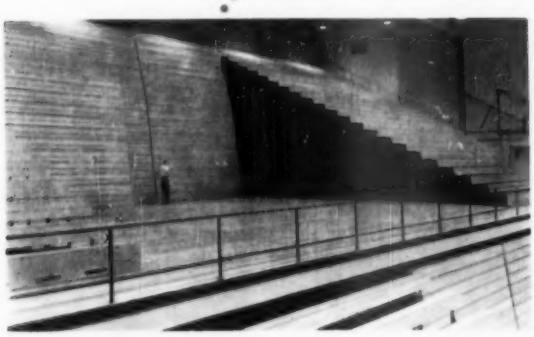
NOW you can have famous-

EZ-A-WAY BLEACHERS with risers & seats in... COLORS

to Blend with Your Color Scheme



The Berlin Chapman Company is proud to pioneer in the development of color in gymnasium seating. Now EZ-A-WAYS are available in colors to harmonize with the decor of your gym. Architects have long recognized the value of harmonious blending of colors and Berlin Chapman Company is happy to join with them in achieving this revolutionary objective. Extensive scientific studies have proven the importance of harmonious coloring in institutions and outdoor play areas. Their findings have proven that proper blending of colors has lessened tension and eye strain and promoted greater and more effective activity as well as relaxation and comfort to both participants and spectators.



Actual installation of 24 rows, over 5,000 seats, Berlin Chapman EZ-A-WAY installed in Vancouver's new multi-million dollar high school, Vancouver, Washington.

Write us today for complete information on EZ-A-WAYS, both from the standpoint of structural superiority and color blending.

Basic colors available are Portland Rose, Gulf Green (as shown), Michigan Blue, Kansas Wheat, California Gold. From these basic colors any shade can be furnished to meet your architect's or personal requirements. Investigate color blending before deciding on your new bleachers. The Berlin Chapman representative in your area will be happy to call on you and explain in detail.

BERLIN SEATING ENGINEERS

BERLIN • WISCONSIN